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CARDIFF COUNCIL

CARDIFF STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

VERSION 2.0

JANUARY 2025

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CARDIFF COUNCIL

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VERSION 2.0

JANUARY 2025

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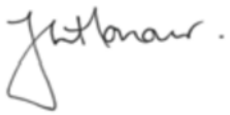

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EXECUTIVE SUMMARY

Planning Policy Wales Edition 12 requires Cardiff Council to prepare a Strategic Green Infrastructure Assessment (GIA) which will guide local planning policy and delivery of GI within Cardiff.

Cardiff Council is currently preparing a new local development plan to be called the Cardiff Replacement Local Development Plan (RLDP) to shape Cardiff to 2036.

It is the vision of the Cardiff RLDP to create a '*fair, healthy, more liveable, sustainable and low carbon city*'. The plan has 11 key objectives:

1) delivering quality low carbon homes to address the housing crisis and future housing needs
2) provide more space for jobs to improve the prosperity of the region
3) provide adequate infrastructure for future community growth
4) be a resilient city becoming a carbon neutral city by 2030
5) provide sustainable and active travel
6) creating healthier environments, reducing inequalities and improving wellbeing
7) creating vibrant and thriving neighbourhoods
8) adapt to challenges post pandemic
9) create sustainable places and neighbourhoods to ensure future growth can be managed
10) ensure the resilience of ecosystems by protecting and enhancing Cardiff's green and blue infrastructure its biodiversity and natural assets
11) protect and enhance Cardiff's historic and cultural assets together with supporting sustainable tourism and cultural sectors

The results of a GIA forms part of the evidence base on which decisions around how land should be developed and managed in Cardiff over the next 15 years to achieve the above objectives, bringing about economic, social and environmental benefits.

The report provides a description of the overall vision for GI in Cardiff (aims and objectives), the GIA methodology of the 1-5 stage process, a review and conclusions and summary of key findings with mapping.

Well-designed GI in the right location can contribute to providing sustainable development and fulfilling the seven well-being goals of the Future Generations Act 2015 and key objectives of the Future Wales National Plan 2040.

A summary of the five stages of the GIA is set out below:

Stage 1 – Setting the Baseline

This section describes the findings of the information gathered on the location and extent of existing areas of greenspace and environmental constraints associated with the delivery of new GI in Cardiff.

Stage 2 – Identifying Priorities

Priorities for GI in Cardiff are established with reference to baseline information from Stage 1. This considers main socio-economic and environmental challenges (improving water and air quality and improving health outcomes), including addressing climate change and nature emergencies, that need to be addressed in Cardiff and to what extent it can be achieved through GI.

Stage 3 - Identifying Opportunities

The objective of Stage 3 is to identify opportunities at a strategic level in Cardiff, where places are best to address the issues identified under Stage 2.

Stage 4 – How GI can be delivered

This step builds on the evidence gathered in Stages 1-3. This section signposts how GI can be delivered.

Stage 5 - Review

This GIA report should be considered a 'live' document to be periodically updated as set out in Chapter 7 of this report. The additional data to be considered as part of any review should be agreed with the Cardiff Council prior to this report being updated.

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Wardell Armstrong LLP (WA), part of SLR, was commissioned by Cardiff Council to undertake a Strategic Green Infrastructure Assessment (GIA).

1.1.2 Cardiff Council is currently preparing a new local development plan to be called Cardiff Replacement Local Development Plant (RLDP) to shape Cardiff over the next 15 years to 2036. The outputs of the GIA provide the evidence base to inform the development of a strategy to implement a green infrastructure (GI) network in Cardiff and to guide revisions to polices within the Cardiff RLDP.

1.1.3 The outputs of the GIA will help decision makers in their assessment of planning applications to ensure high quality, multifunctional GI in the right location is embedded into development proposals.

1.2 Definitions

Green Infrastructure (GI)

1.2.1 Planning Policy Wales (PPW) 12, paragraph 6.2.1 defines GI as:

"***Green infrastructure is the network of natural and semi-natural features, green spaces, rivers and lakes that intersperse and connect places. Component elements of green infrastructure can function at different scales and some components, such as trees and woodland, are often universally present and function at all levels. At the landscape scale green infrastructure can comprise entire ecosystems such as wetlands, waterways, peatlands and mountain ranges or be connected networks of mosaic habitats, including grasslands. At a local scale, it might comprise parks, fields, ponds, natural green spaces, public rights of way, allotments, cemeteries and gardens or may be designed or managed features such as sustainable drainage systems. At smaller scales, individual urban interventions such as street trees, hedgerows, roadside verges, and green roofs/walls can all contribute to green infrastructure networks.***

1.2.2 PPW 12 describes a GIA as "***providing key evidence to support the preparation of development plans" and "should use existing datasets, and the best available information, to develop an integrated map-based evidence resource for biodiversity, ecosystem resilience and ecosystem service provision'***.

1.2.3 "***The GIA and outcomes should also be given early in development proposals and inform the design and implementation of projects***".

1.3 The Requirement and Purpose of GIA for Cardiff

1.3.1 To deliver GI tailored to achieve the maximum benefits for local communities, the natural environment and biodiversity, there is a requirement under PPW 12 for Cardiff Council to have a current inventory of GI.

1.3.2 From the compiled baseline data for Cardiff, opportunities to expand, restore and improve GI resilience and connectivity have been explored as part of this GIA.

1.3.3 The GIA outputs serve as a framework to inform policies in the new Cardiff RLDP and to provide guidance to public bodies, partnerships and developers when placemaking[1]. It outlines what GI is considered appropriate and '*in the right place*' at a development and strategic level within Cardiff. The recommendations for GI aim to address key themes of the South-Central Area Statement (building resilient ecosystems, connecting people with nature, working with water, improving our health and improving our air quality) and considers evidence provided in the latest Well-Being Assessment (2022).

1.3.4 The RLDP GIA indicates the key strategic baseline data, the key strategic priorities and key strategic opportunities.

What are the key outputs of the GIA?

1.3.5 The GIA outputs, in summary provide:

- a tool to aid placemaking i.e. what GI is best suited to a location considering the needs of the local communities and delivering health benefits (e.g. recreation/sports/education, active travel, clean air, accessible natural greenspaces, creating aesthetically and biodiverse spaces, creating a sense of place) and environmental constraints (flooding, air quality management areas, managing noise pollution, heat island effects) to deliver connected high-quality multifunctioning spaces;

[1] Planning Policy Wales 12, page 14: Defines Placemaking: Extracts: '*a holistic approach to the planning and design of development and spaces, focused on positive outcomes. It draws upon an area's potential to create high quality development and public spaces that promote people's prosperity, health, happiness and well-being in the widest sense'. 'Placemaking considers the context of development site and its wider surroundings'*.

- identification of key nature networks which should be avoided and protected (buffered) from development (e.g. Statutory and Non-Statutory Nature Conservation Sites, Priority Habitats or Species, river corridors);
- advice on types of GI which may be suitable to buffer designated sites, priority habitats and river corridors and how they may provide ecosystem services to local communities;
- identification of green space areas at a landscape scale which can be used for habitat restoration /creation and/or maintained to favourable conservation status; and
- a review strategy for GIA.

1.3.6 **Scope of Report**

1.3.7 Below sets out what is covered within each chapter:

Chapter 2: Background

- Context of Cardiff and overview of existing GI;
- Existing GI Policy within the LDP 2006-2026;
- Other Key Policy, Legislation, Relevant Plans and Strategies;
- Drivers for GI in Cardiff; and
- Methodology for the GIA Stage Process.

Chapter 3: GIA Stage 1 - Setting the Baseline

- This section describes the findings of the information gathered on the location and extent of existing areas of greenspace and environmental constraints associated with the delivery of new GI in Cardiff.

Chapter 4: GIA Stage 2 - Identifying Priorities

- Priorities for GI in Cardiff are established with reference to baseline information from Stage 1. This considers main socio-economic and environmental challenges (improving water and air quality and improving health outcomes), including addressing climate change and nature emergencies, that need to be addressed in Cardiff and to what extent it can be achieved through GI.

Chapter 5: GIA Stage 3 - Identifying Opportunities

- The objective of Stage 3 is to identify opportunities at a strategic level in Cardiff, where places are best to address the issues identified under Stage 2.

Chapter 6: GIA Stage 4 - How GI can be delivered

- This step builds on the evidence gathered in Stages 1-3. This section signposts how GI can be delivered: e.g. Council policy/other GI guidance documents, council departmental cooperation, Local Nature Partnerships, local interest groups including local resident groups.

Chapter 7: GIA Stage 5 - Review

- This GIA report should be considered a 'live' document to be periodically updated as set out in this section of the report. The additional data to be considered as part of any review should be agreed with the Cardiff Council prior to this report being updated.

2 BACKGROUND

2.1 Context of Cardiff and Overview of Existing GI

2.1.1 Located in the southeast of Wales, Cardiff, as the capital city of Wales, is a tourist location and is a city which offers a wealth of lifestyle and cultural experiences.

2.1.2 Cardiff is the largest urban area in Wales. The landscape is predominately 50% urban with financial and business services, education, health, commercial and tourism forming the main industries, with agriculture more prevalent towards the outskirts.

2.1.3 Cardiff is bordered to the northeast by the City of Newport, Caerphilly and Rhondda Cynon Taff boroughs to the northwest, to the southwest by the rural district of Vale of Glamorgan and the Severn Estuary to the southeast as shown on Drawing Number CA12850-067.

2.1.4 Cardiff comprises 28 wards which are shown on Drawing Number CA12850-001. The city covers approximately 14,000 hectares supporting a multicultural population of approximately 362, 400 (2021[2]) which equates to approximately 12% of Welsh population (3, 107,500[1]) located within 6% of country's land mass. It is the fastest growing Core City in the UK with its population growth expected to increase by 20% over the next two decades[3]. Cardiff is located within the most densely populated area of Wales which also encompasses Newport, Bridgend, the Vale of Glamorgan, Merthyr Tydfil and Rhondda Cynon Taf.

2.1.5 Whilst urban development expanded during the industrial revolution around the Cardiff Port which serviced the heavy industries of South Wales, the city has valuable and protected green space[4].

2.1.6 Existing important nature networks in Cardiff include Cardiff Beech Woodland in the north, the corridors of the rivers Ely, Taff, Rhymney and Nant Fawr stream, Wentloog levels connecting to the Gwent Levels, and coastal habitats associated with the Severn Estuary (including saltmarsh, sandflats, mudflats and reefs). Such is their importance

[2] https://www.ons.gov.uk/visualisations/censuspopulationchange/W06000015/
[3] https://businessnewswales.com/report-reveals-cardiff-is-the-fastest-growing-core-city-in-the-uk/ - January 2024.
[4] Natural Resources Wales / Local green spaces Green space: vegetated land and areas such as rivers, canals, lakes and ponds and seashore maintained for recreation.

that a number of these habitats are protected at an international and/or national level.

2.1.7 Flat Holm Island is another nationally valuable nature conservation site which sits within the English Channel and is managed by a partnership of Cardiff Council and the Flat Holm Society.

2.1.8 Cardiff also has a range of non-statutory Sites of Importance for Nature Conservation which recognise the importance of the habitats and species they support at a county level.

2.1.9 Other habitats/green spaces within the city include the freshwater habitats of Cardiff Bay, Llanishen and Lisvane Reservoirs and Roath Lake, habitat corridors along active travel routes/footpaths and active/disused railway lines, street trees, ponds, parks, gardens, golf courses, allotments, cemeteries/church yards, brownfield sites and sustainable urban drainages (SuDs) systems.

2.1.10 With the expected forecast in population growth and demands in provision of housing /employment and associated infrastructure, Cardiff Council are faced with the challenge of ensuring existing GI is protected, where possible, and enhanced at a strategic scale.

2.2 Existing GI Policy within the LDP 2006-2026

2.2.1 The existing LDP 2006-2026[5] includes ***Policy KP16: Green Infrastructure*** which requires planning proposals to demonstrate how the GI has been considered and integrated into proposals and specifies that appropriate compensation of GI is required if there is an overall loss of GI. The policy includes references to other LDP policies which intend to protect the natural heritage assets which are key to Cardiff's character, value, distinctiveness and sense of place.

[5] https://www.cardiff.gov.uk/ENG/resident/Planning/Local-Development-Plan/Pages/default.aspx

i. **Undeveloped countryside and coastline (EN1 and EN2);**
ii. **Landscape, geological and heritage features which contribute to the City's setting (EN3);**
iii. **Strategically important river valleys of the Ely, Taff, Nant Fawr and Rhymney (EN4);**
iv. **Biodiversity interests including designated sites and the connectivity of priority habitats and species (EN5, EN6 and EN7);**
v. **Trees (including street trees), woodlands and hedgerows (EN8);**
vi. **Strategic recreational routes, cycleways and the public rights of way network (T5, T6 and T8);**
vii. **Parks, playing fields, green play areas and open spaces (C4 and C5); and**
viii. **Growing spaces including allotments, community orchards and larger gardens; and**
ix. **Holistic integrated surface water management systems (EN10).**

2.2.2 The GI policy is also critical in meeting other LDP policies including climate change (KP15), enhanced biodiversity habitat and species connectivity (EN5, EN6 and EN7), providing sports and recreation opportunities (C4), contributing to health and wellbeing policy (C6), visual benefits (KP5) and minimising impacts to natural resources (KP18).

2.3 Other Key Policy, Legislation, Relevant Plans and Strategies

2.3.1 Listed below are current key policy, legislation, plans and strategies.

Other Planning Policy/ Guidance

- Planning Policy Wales Edition 12[6]
- Green Infrastructure Supplementary Planning Guidance (SPG) November 2017[7]
- Green Infrastructure Plan and Resilience of Ecosystems Duty (BRED) Forward Plan 2019[8]

[6] https://www.google.com/search?client=firefox-b-d&q=Planning+policy+Wales+12

[7] https://cardiff.moderngov.co.uk/documents/s18690/Item%209%20App%201%20SPG%20Green%20Infrastructure.pdf

[8] https://cardiff.moderngov.co.uk/documents/s34305/Cabinet%2026%20Sept%202019%20Biodiversity%20BRED%20App.pdf

- Technical Advice Note 5: Nature and Conservation and Planning 2009[9]

Legislative Framework

- Future Wales: The National Plan 2040[10]
- Well-being Future Generations Act 2015[11]
- Environment (Wales) Act 2016[12]
- The Conservation of Habitats and Species Regulations 2017 (as amended)[13]
- The Wildlife and Countryside Act 1981 (as amended)[14]
- National Natural Resource Policy 2017[15]
- The Climate Change (Carbon Budgets) (Wales) Regulations 2018[16]
- The Active Travel (Wales) Act 2013[17]

Relevant Plans and Strategies

- Natural Resources Wales (NRW) South Central Area Statement[18]
- NRW State of Natural Resources Report (SoNaRR) for Wales 2020[19]
- Cardiff Local Well-Being Plan 2023-2028[20]
- Cardiff Local Nature Recovery Action Plan[21]
- One Planet Cardiff – Vision for Carbon Neutral City by 2030[22]

[9] https://www.gov.wales/technical-advice-note-tan-5-nature-conservation-and-planning
[10] Future Wales: the national plan 2040 | GOV.WALES
[11] https://www.futuregenerations.wales/about-us/future-generations-act/
[12] Environment (Wales) Act 2016 (legislation.gov.uk)
[13] The Conservation of Habitats and Species Regulations 2017 (legislation.gov.uk)
[14] Wildlife and Countryside Act 1981 (legislation.gov.uk)
[15] Natural resources policy | GOV.WALES
[16] The Climate Change (Carbon Budgets) (Wales) Regulations 2018 (legislation.gov.uk)
[17] Active Travel Act guidance | GOV.WALES
[18] https://naturalresources.wales/about-us/what-we-do/strategies-and-plans/area-statements/south-central-wales-area-statement/introduction-to-south-central-area-statement/?lang=en
[19] https://naturalresources.wales/evidence-and-data/research-and-reports/state-of-natural-resources-report-sonarr-for-wales-2020/?lang=en
[20] https://cavuhb.nhs.wales/files/board-and-committees/board-2022-23/72a-appendix-1-cardiff-local-well-being-planpdf/
[21] https://c3sc.org.uk/call-for-the-cardiff-nature-recovery-action-plan/
[22] https://www.oneplanetcardiff.co.uk/wp-content/uploads/OPC%20vision%20document.pdf

- NRW Marine Area Statement[23]
- Cardiff Flood Risk Management Plan 2015[24]

2.4 Drivers for GI in Cardiff

2.4.1 The Well-Being of Future Generation (Wales) (WFG) Act 2015 sets out seven well-being goals (Figure 1) and how public bodies must collaborate with people and communities better, to achieve them long term. The intention of the WFG Act 2015 is to achieve a balance of environmental, social, economic and cultural aspects of development to bring about benefits to create a *"…strong, healthy and just society"*[1].

2.4.2 Key issues in Cardiff relate to managing the environmental impacts of population growth, relate to the delivery of new housing and employment opportunities and associated infrastructure, and the higher levels of transport use and waste generated. Although general levels of health are high in Cardiff, the 2022 Well-Being Assessment highlights that there are clear inequalities across the city. Cardiff also has the highest levels of nitrogen dioxide (NO^2) and particulate matter pollution in Wales and there tends to be an association with higher levels of air pollution and deprivation.

Figure 1: Well-Being of Future Generations (Wales) Act 2015 - Well-Being Goals[25]

[23] https://www.google.com/search?client=firefox-b-d&q=NRW+marine+Area+statement+
[24] Cardiff Flood Risk Management Plan
[25] https://www.gov.wales/sites/default/files/publications/2021-10/well-being-future-generations-wales-act-2015-the-essentials-2021.pdf

2.4.3 Environmental pressures experienced globally, including climate change, biodiversity decline, sustainable use of natural resources and food security are also experienced at a local scale in Cardiff. These threats to ecosystems are raised in the SoNaRR 2020 and discussed further in Chapter 3.0.

2.4.4 To tackle these challenges Cardiff Council's Green Infrastructure Plan and Resilience of Ecosystems Duty (BRED) Forward Plan includes six strategic objectives to maximise the benefits that GI can deliver in Cardiff and to contribute goals of the WFG Act 2015. In summary the GI approach allows benefits delivered by ecosystem services to be considered at all levels including a landscape scale.

2.4.5 Our economy, health and well-being are dependent on the extent to which ecosystems are able to provide us with our food, clean water and air, and the raw materials and energy for our industries, as well as helping to protect us against the impacts of climate change. These are referred to as ecosystem services[26] (See Figure 2).

Figure 2 Ecosystem Services

[26] Ecosytem services are the contributions elements of the natural environment provide for wellbeing and quality of life.

2.4.6 GI contributes to four main groups of ecosystem services (supporting services, regulating services, provisioning services and cultural services) including absorption of surface water to prevent flooding, cooling of urban areas during extreme heat, reducing effects of adverse air and noise pollution, carbon sequestration and providing attractive areas for recreation and to connect people with nature.

2.4.7 Changes in the distribution and abundance of plants, fungi, animals, and microbes affect ecosystem functions and the capacity of those functions to deliver ecosystem services. Loss of species from ecosystems affect their ability to resist invasion by non-native species for example, that can affect production and nutrient cycling, and thereby the resilience, reliability and stability of ecosystems.

2.4.8 Ecosystems that are more biodiverse are generally more resilient and better able to adapt to pressures and changes, such as impacts from development and climate change. This is known as ecosystem resilience and is a key element of sustainable placemaking as outlined in many of the existing Plans and Strategies listed under paragraph 2.3.1, including national priorities set out in the National Natural Resource Policy 2017, delivering nature-based solutions and taking a place-based approach.

Cardiff's Climate Emergency

2.4.9 Sustainable development is "*development that meets the needs of the present, without comprising the ability of future generations to meet their own needs*"[27]. Cardiff growth has been identified as unsustainable and is currently a 'Three Planet City', meaning Cardiff's population is consuming natural resources and generating carbon dioxide ($C0_2$) at a rate which on a global scale would require three planets to support it. Cardiff Council therefore declared a 'Climate Emergency' in Cardiff in March 2019 and published One Planet Cardiff (OPC) strategy to "*scale up our ambition and action to mitigate a climate change disaster and to ensure that Cardiff can thrive as a resilient, low carbon City*"[28].

2.4.10 To be a Carbon Neutral City by 2030 will require the city's growth to be sustainable with resilient ecosystems which can adapt to the pressures of climate change (i.e. rising sea levels as a coastal location, flash flooding and increased temperatures).

[27] https://www.sd-commission.org.uk/pages/what-is-sustainable-development.html

[28] https://www.oneplanetcardiff/co.uk/wp-content/uploads/OPC%20vision%20document.pdf

2.4.11 It's recognised to mitigate the impacts of climate change generates an opportunity to provide connected green space[29] which can offer multiple benefits, to contribute to towards achieving the seven well-being goals.

2.4.12 The OPC strategy states:

"*In tackling Climate Change, there is opportunity for Cardiff and the region to emerge as a contemporary, low carbon place for all; a greener, healthier city with more equity across communities as we realise the co-benefits of creating new, sustainable jobs and economic sectors, addressing fuel poverty, improving public transport and active travel provision and providing many more healthy, green spaces and clearer air that support social well-being*".

Cardiff's Nature Emergency

2.4.13 It is increasingly evident that well designed nature-based solutions should be delivered to enable communities to prosper from the benefits of sustainable development and to mitigate the Climate Change Emergency. Equally important is provision of green space for biodiversity as it supports the functioning and resilience of ecosystems as outlined in the Welsh Nature Recovery Action Plan (NRAP), December 2015 and its update published in 2021. The NRAP states the need to proactively develop Resilient Ecological Networks to maintain and enhance the wider resilience of Wales's ecosystems.

2.4.14 It has been a duty of a Public Body under Section 6 of the Environment (Wales) Act 2016 to seek to maintain and enhance biodiversity and to promote resilience of ecosystems. Local planning authorities under this Act must assess if the five attributes; Diversity, Extent, Condition, Connectivity and Aspects (other referred to as the DECCA Framework) of defining ecosystem resilience are promoted by an application.

2.4.15 The 'DECCA' attributes are explained further in NRW Freshwater Resilient Ecological Networks: A guide for practitioners in Wales[30].

[29] Natural Resources Wales / Local green spaces Green space: vegetated land and areas such as rivers, canals, lakes and ponds and seashore maintained for recreation.

[30] resilient-ecological-networks-practitioner-guide.pdf (cyfoethnaturiol.cymru)

DECCA FRAMEWORK:

Diversity - Maintaining and enhancing biodiversity at every scale, through habitats and population dynamics. Supporting the complexity of ecosystem functions and interactions that deliver services and benefits.

Extent - Incorporating measures which maintain and increase the area of semi-natural habitat/features and linkages between habitats. Smaller ecosystems have reduced capacity to adapt, recover or build resistance.

Condition - The condition of an ecosystem is affected by various pressures acting as short term and long-term types of disturbance. Both direct and wider impacts should be considered. E.g., climate change, pollution, invasive species, land management neglect, etc.

Connectivity - This is the link between and within habitats, taking the form of physical corridors, stepping stones in the landscape, or patches of similar vegetation that together create a network that enables the movement of genes, species and natural resources. Developments should take opportunities to develop functional habitat and ecological networks within and between ecosystems, building on existing connectivity.

Aspects - Adaptability, recovery and resistance to/from a disturbance are defining features of ecosystem resilience; it is a product of the above four attributes.

2.4.16 Adequate resilient habitat is essential to enable species populations to stabilise and expand in size and range rather than decline.

2.4.17 A measure of success of ecosystem resilience is the recording of healthy populations of key indicator species such as otter, hedgehog and swifts but the Welsh Government declared a nature emergency in 2021 in response to the identification that of the 3,902 species studied in Wales, 17% were at risk of extinction[31]. Species can be displaced because of changing climatic conditions and there is a risk that non-native invasive species could be more adaptable to extreme temperatures, increasing in number and outcompeting our native species.

2.4.18 The pressure on Cardiff's biodiversity was acknowledged through the declaration of a 'Cardiff's Nature Emergency' in November 2021.

2.4.19 With the challenges to resolve the Nature and Climate Change Emergencies so closely interlinked, both emergencies are key drivers to reform planning policy. The responses to tackle both should be aligned to ensure ecosystems are resilient and nature is

[31] The Nature Emergency: Climate Change - Climate Action Wales (gov.wales)

valued to expedite the reversal of biodiversity loss. Action locally to facilitate restoration of habitats and species populations would also complement the agreement made at the United Nations Biodiversity Conference (COP) 15 Biodiversity Summit 2022, for a '*Global Biodiversity Framework*' (GBF) which sets 23 targets to be met by 2030 with the intention to halt and reverse loss of biodiversity globally. These targets include conserving 30% of land, oceans and inland water and restoring 30% of degraded ecosystems.

2.4.20 In response to the GBF, the Welsh Government produced a publication '*Biodiversity Deep Dive: Recommendations'*[32] which has one of its eight objectives as ensuring Nature Recovery is embedded in policy and strategy in public bodies in Wales. The objectives seek to ensure a Nature Network Map is in place which identifies key areas where adverse pressures on biodiversity should be reduced (e.g. on protected sites) where degraded habitats can be restored (i.e. delivering a net benefit for biodiversity) and connects these sites across the wider landscape whilst prioritising areas to deliver beneficial outcomes for local communities and wildlife (such as well-being and recreation). The Cardiff Local Nature Partnership (LNP) is developing a plan, referred to as the Cardiff NRAP, which identifies Nature Recovery Zones and Resilient Ecological Networks which should be restored or improved for nature in Cardiff. NRAPs are developed with the involvement of Local Communities.

2.5 GIA - Stage Approach

2.5.1 The methodology for each 'Stage' of the GIA process is outlined in this section:

- Stage 1 - Setting the Baseline – Evidence Base
- Stage 2 - Identifying Priorities
- Stage 3 - Identifying Opportunities
- Stage 4 - Delivery of GI
- Stage 5 - Review - Implementation and Monitoring of the GIA process

[32] https://www.gov.wales/biodiversity-deep-dive-recommendations

Stage 1 – Setting the Baseline - Resources Used to Inform GIA

2.5.2 Existing GI information was collated from a variety of sources. The data sets informing the outputs within this GIA (V2.0) document are listed in Appendix 1.

2.5.3 An overview drawing has been prepared showing the combined GI assets in Cardiff mapping the collated data set information (Drawing Number CA12850-030). Detailed drawings differentiating between the GI baseline layers for each Cardiff ward are provided in Appendix 2 (Drawing Numbers CA12850-002 to 029).

Stage 2 – Identifying Priorities

2.5.4 The datasets, plans and strategies for Cardiff were reviewed to identify risks to ecosystems and threats/challenges to deliver GI across the county.

Stage 3 - Identifying Opportunities

2.5.5 Opportunities to deliver and enhance GI strategically across each ward has considered the priorities identified in Stage 2 and from analysis of the baseline data set information in Stage 1.

2.5.6 Cardiff has been split into four strategic GI opportunity areas: Farmland, woodland and rural settlements, urban, river corridors and coastal as shown on Drawing Number CA12850-066. Detailed information on appropriate strategic GI for each GI opportunity area is provided in Tables 6-9.

Stage 4 -Delivery of GI

2.5.7 This step builds on the evidence gathered in Stages 1-3. This section signposts how GI can be delivered.

Stage 5 - Review of the RLDP GIA

2.5.8 A description of the review process is provided.

3 STAGE 1: BASELINE GI INFORMATION

3.1 Introduction

3.1.1 The purpose of identifying the baseline GI for the Cardiff is twofold:

- Firstly, it can be used to identify areas which could be safeguarded as contributing to ecological networks for their potential importance for adaptation and mitigation to climate change or other pressures, for habitat restoration or creation, or which provide key ecosystems services, to ensure they are not unduly compromised by future development; and
- Secondly it can be used to identify opportunities where strategic GI could be maximised as part of development proposals, requiring the use of nature-based solutions as a key mechanism for securing sustainable growth, ecological connectivity, social equality and public well-being.

3.2 Cardiff GI Assets

3.2.1 Cardiff contains a wide range of GI assets. They include public and private assets, with and without public access. A number are protected by legislation or policies because of their ecological, cultural, heritage and landscape value. This section outlines what GI is already in the Cardiff area, outlines the key ecological assets and ecological networks and indicates their current condition and main threats these are under.

3.2.2 An overview map has been produced which collates the baseline GI information from the data sources outlined in Chapter 2. The following sections summarise the main GI assets across Cardiff.

3.2.3 Cardiff has 28 wards. The locations and ward names are labelled on the Overview Ward Plan - Drawing Number CA12850-001.

Biodiversity /Nature Conservation Assets

Cardiff Ecosystems -NRW Area Statements

3.2.4 Area Statements provide an important source of information for strategic GIA. Cardiff is covered within the South-Central Area Statement. The main issues and challenges highlighted in this Area Statement is ‘Working with Water’, ‘Improving Health Outcomes’ and ‘Improving Air Quality’.

3.2.5 Ecosystem profiles have been developed, based on evidence, to broaden the understanding of the key ecosystems within the Area Statement Area and how they can provide services to address the key issues and challenges in Cardiff. For Cardiff the relevant ecosystems are grassland, woodland, coastal/marine, freshwater and urban.

3.2.6 Table 1 provides a summary of the broad ecosystems and the area (hectares/percentage) they cover in Cardiff (information provided by Datamap Wales[33]).

Table 1: Ecosystems in Cardiff Total Cardiff Area = 14,000 Hectares (ha)		
Broad Ecosystem Class	**Area of Cardiff (ha)**	**Percentage Area of Cardiff (%)**
Semi-natural grassland	950	6.7
Enclosed farmland	4322	30.8
Woodlands	1570	11.2
Coastal margins	30	0.2
Open water, wetlands and floodplains	480	3.4
Urban/not habitat	6699	47.8
Marine	42	0.3

3.2.7 Table 1 indicates that nearly 50% of Cardiff is defined as being Urban followed by enclosed farmland found on the outskirts of the city centre with habitats including grassland (fields of permanent pasture and arable crops) bounded by hedgerows and trees. Semi-natural grassland which has a greater species diversity is less prevalent. Woodland represents the third largest ecosystem type in occurrence in Cardiff with the main areas found to the north of the M4 motorway with a range of extensive blocks of ancient, semi-natural, broadleaved and coniferous woodlands.

3.2.8 NRW has produced Ecosystem profiles which set out the issues and priorities relevant to each ecosystem in each area. These are summarised below:

Urban

3.2.9 As indicated above, nearly 50% of Cardiff comprises the urban ecosystem. The urban ecosystem, and the human population it supports, significantly affects all the other

[33] https://datamap.gov.wales/

ecosystems identified in Cardiff. As identified in the South-Central Area Statement, this includes direct impacts on ecosystems that provide important natural resources, such as water, food and energy. Wide reaching indirect impacts on other ecosystems also occurs through the consumption of these natural resources and the waste this produces. Population growth in Cardiff will place more pressure on these ecosystems.

3.2.10 The key trends affecting natural resources relevant to urban ecosystems and the drivers of change which affect them which could undermine, or support ecosystem services are:

- Climate change
- Pollution
- Land Use Change
- Invasive Non-Native Species (INNS)
- Over exploitation

Grassland

3.2.11 The South Central Area Statement defines the grassland habitats in this area as being in poor condition but is reversible. Grassland delivers goods and services in terms of food from plant and animal sources, they can provide health benefits in terms of provision of recreation/amenity but also assist with managing water and flood mitigation, improving water quality and air quality, and sequester carbon which helps mitigate the effects of climate change. Smith (2021) in SoNaRR 2020 lists key issues for grassland across Wales as agricultural intensification, insufficient management and abandonment, insufficient protection and management of important sites, land-use change, climate change and air pollution.

3.2.12 Grasslands in the South Central area are also at risk of anti-social behaviours, agricultural intensification, forestry, development pressure / fragmentation / urbanisation, lack of management, native and INNS, biosecurity, peri-urban pressures and wildfire. Key priorities for building resilience in grasslands, listed in the South Central Area Statement which are relevant to Cardiff, are: enabling appropriate grassland management to improve condition; create resilient ecological networks to extend, connect and buffer grassland sites; connecting people with grasslands, in

urban areas, road verges, and through engagement about the benefits of grasslands such as sustainable food.

Woodland

3.2.13 There are extensive areas of woodland in the north of Cardiff. Much of this woodland, including ancient woodland, is protected by statutory designations, e.g. Cardiff Beech Woods Special Area of Conservation (SAC) and Garth Wood Site of Scientific Interest (SSSI) and tree protection orders. Woodland areas are also designated as Sites of Importance for Nature Conservation (SINCs). Pockets of undesignated ancient woodland also exist separately within Cardiff and are shown on the detailed ward maps provided in Appendix 2 (Drawing Numbers CA12850-002 to 029). Core woodland habitat can be found extending into Cardiff Centre in Bute Park along the River Taff corridor.

3.2.14 As the Area Statement sets out, the woodlands in Cardiff have a key role to play in nature recovery through their habitat value and long-term presence in the landscape, when properly managed for optimal condition. Woodlands also have a key role to play in the climate emergency, and climate change mitigation through carbon storage, sequestration and its role in the circular economy. The right tree in the right place for the right reason, can also bring many co-benefits: trees in urban areas benefit air quality and our well-being; trees in the uplands help flood alleviation; and native trees support biodiversity[6].

3.2.15 For woodlands in South Central, the Area Statement states that the top priorities to build resilience are:

- With a significant extent and robust connectivity north of the M4, increasing diversity of species and improving condition of semi-natural woodland. A key area to start will be to focus on enhancing and restoring the areas of irreplaceable Ancient Semi-Natural Woodland.
- In all areas natural colonisation and appropriate planting in and around existing semi-natural woodlands to enhance and buffer woodland patches would enhance connectivity. Increasing woodland connectivity through linear planting schemes to create shelterbelts and reinstate hedgerows, will contribute to flood risk management, reduced soil erosion, improved water quality and improved livestock welfare in hot and cold weather.

- Preserving existing large trees and woodland, encouraging woodland regeneration and colonisation are essential for building ecosystem resilience and among the best approaches for storing and capturing carbon (Woodland Trust's Emergency Tree Plan[34]).

3.2.16 The following priorities for woodland, which are relevant for Cardiff, have been identified as bringing more woodland into planned management, improving and adapting the management of existing managed woodland, compensatory planting for permanent woodland loss associated with renewable energy provision and approved development and increasing new woodland creation.

Coastal/marine

3.2.17 The saltmarsh in the Severn Estuary area around the Taff and Rhymney river mouths in Cardiff forms the western part of the Severn Estuary SAC. The Severn Estuary is also designated as a Special Protection Area (SPA) and Ramsar. The Area Statement states that the coastal ecosystem in South Central Area has a key role to play in nature recovery through the interface between terrestrial and marine habitats, modifying water quality, stabilising the coastline and providing valuable recreation opportunities.

3.2.18 The Area Statement also states that the coast at Cardiff is particularly at risk due to its proximity to Cardiff's dense urban centre, and from visitors further afield. This could lead to issues such as recreational effects including disturbance from dogs and illegal access, lack of management, biosecurity, litter, wildfire and urban development. The presence of the Wales Coast Path along Cardiff's coastline could also increase the risk of habitat disturbance. There are important high tide roosts in places such as the Rhymney River area where birds could be disturbed due to access and recreation.

3.2.19 The following top priorities for coastal ecosystems set out in the Area Statement for the South Central area, which are relevant to Cardiff, are to broaden and reconnect coastal habitats, building extent and connectivity, restore natural processes to improve condition and identify nature-based solutions for coastal adaptation at suitable locations.

Freshwater

[34] Emergency Tree Plan: How to Increase Tree Cover – Woodland Trust

3.2.20 Numerous watercourses (and associated predominantly developed floodplains) cross the county, providing corridor links between the open countryside and the city centre. The three main river corridors in Cardiff (Ely, Taff and Rhymney) form important GI corridors through Cardiff providing habitats and corridors for wildlife, access and active travel routes (such as the Taff Trail) for local communities and opportunities for recreation. There are also four key ordinary waters courses in Cardiff which are the Whitchurch Brook, Fairwater Stream, Roath Brook and Nant Glandulas. The Dock Feeder is also considered an ordinary watercourse. The Wentloog Levels comprises a network of reens (ditches).

3.2.21 The main risks and issues affecting the freshwater ecosystem in the South Central area, including Cardiff, are impacts from aging infrastructure (culverts, bridges, pipes and services) which are struggle to cope with increased volumes of water linked to urban creep and increased intensity of rain events. This leads to localised flooding, barriers to fish movement and pollution incidents. Freshwater ecosystems are also affected by urban diffuse pollution, microplastics, combustion chemical and legacy agricultural and industrial chemicals. Antisocial behaviours such as littering, wildfires, fly tipping, illegal waste also affects freshwater. Misconnections where plumbing and drainage wastewater and sewage are connected to a surface water drain also pollute local watercourses. There is also greater development pressure in the South Central Area particularly around the M4 corridor.

3.2.22 The following top priorities to build resilience in the freshwater ecosystem set out in the Area Statement are:

- Building resilience throughout the catchment – restoring natural processes from the headwaters to the river mouth and all the watercourses in between.
- Focus on the urban environment, restoring physically modified watercourses, replicating natural processes and nature-based solutions for improved water quality and quantity.
- The freshwater environment is valued and considered on a catchment scale in decision making. Impacts on water are better considered through decision making and opportunities for water to be integrated and built into design and regeneration.

- Education and engagement with communities and individuals to better understand and value the water environment, to be preventative and restorative in their individual actions.

Protected & Notable Species in Cardiff

3.2.23 Cardiff's ecosystems support a wide range of wildlife including protected and notable species. Some of the more notable protected species in Cardiff include otter (*Lutra lutra)* which is present on all three main rivers throughout Cardiff, ten species of bat, some of which are present throughout the city, some populations of great crested newt (*Triturus cristatus*), and an extensive dormouse (*Muscardinus avellanarius*) population, mostly to the north and east of the city.[35] Shrill carder bee (*Bombus sylvarum*) populations exist within Gwent Levels – Rhymney and Peterstone SSSI.

3.2.24 Adequate resilient habitat in Cardiff is essential to enable species populations to stabilise and expand in size and range rather than decline. Species can be displaced because of changing climatic conditions and there is a risk that INNS could be more adaptable to extreme temperatures, increasing in number and outcompeting the native species found in Cardiff.

Nature Conservation Designations

3.2.25 Cardiff has a variety of sites designated for their nature conservation value. Their importance on a geographical scale and known status on their current condition is summarised below. The locations of the international and nationally protected sites are included on the strategic GI assets plan (Drawing Number CA12850-030) with these also shown on the individual ward plans alongside the non-statutory sites of nature conservation.

<u>International Designated Sites</u>

- 2 Special Areas of Conservation (SAC)
  - Severn Estuary
  - Cardiff Beech Woods: - (Unfavourable Condition[36])
- 1 Special Protection Area (SPA) – Severn Estuary

[35] www.biodiversitywales.org.uk/Cardiff
[36] Natural Resources Wales / Protected sites baseline assessment 2020

- 1 Ramsar – Severn Estuary

Nationally Designated Sites

- 17 Sites of Special Scientific Interest (SSSI) designated for their biodiversity (Table 2)

Table 2: SSSI and Condition Status

SSSI	Feature Name	Condition[33]
Caeau Blaen-Bielly	Marshy and Neutral grassland	Unknown
Castle Coch Woodland and Road Section	Semi-natural woodland Road section	Unfavourable Unfavourable
Coed Y Bedw	Semi-natural woodland	Unknown
Ely Valley	Monk's hood	Unknown
Fforestganol a Chwm Nofydd	Semi-natural woodland	Unfavourable
Flat Holm	Maritime cliffs and associated ledges/crevices Wild leek	Favourable Favourable
Garth Wood	Money spider Semi-natural woodland	Favourable Unknown
Long Wood / Glamorgan Canal	Semi-natural woodland Standing water	Unfavourable Unknown

Table 2: SSSI and Condition Status		
SSSI	**Feature Name**	**Condition[33]**
Gwent Levels – Rumney and Peterstone	Variety of invertebrates Standing water	Unknown Unfavourable
Lisvane Reservoir	Overwintering wildfowl	Unknown
Llanishen and Lisvane Reservoir Embankments	Grassland fungi	Unknown
Severn Estuary	Field garlic Sea barley Sea clover Slender hare's ear Swamp	All unknown
Ty Dy Moor	Broadleaved cottongrass	Unknown
	Marshy grassland	Unknown

- 6 Local Nature Reserves (LNRs): -Conditions unknown
  - Cardiff Bay Wetlands and Hamadryad Park
  - Cwm Nofydd Fforest Ganol
  - Flat Holm
  - Glamorganshire Canal
  - Hermit Wood
  - Howardian

Non-Statutory Designated Sites

- 181 Sites of Importance for Nature Conservation (SINCs)[37] – conditions unknown

Greenspace within Urban Areas

Historic

3.2.26 Cardiff has several public parks, including Cardiff Castle and Bute Park, Pontcanna Fields & Llandaff Fields, as well as Roath Park, Insole Court, and Cathays Cemetery. Tree cover in historic green spaces like these can contribute to well-being, air quality, moderating temperatures and reducing flooding.

3.2.27 Analysis carried out by independent charity Fields in Trust, in collaboration with Cardiff Council, has found that 19% of the city is publicly accessible parks and green spaces - an area of 2682 hectares (the equivalent of 3756 football pitches). 1073 hectares of green space in Cardiff, is owned and managed by Cardiff Council[38].

Neighbour GI Assets

3.2.28 As well as those GI assets already described, the County comprises a range of open/green spaces (e.g. allotments, parks, cemeteries/church yards/golf courses and outdoor sport areas) located in and around the main settlements. There are 28 allotment sites currently in Cardiff.

3.2.29 Private gardens, street trees and other features (e.g. green roofs and SuDs) and government and public sector buildings grounds (educational, community centres, hospitals, libraries, courts, prisons, public housing, emergency service facilities) are other examples of GI assets in Cardiff.

3.2.30 According to the Cardiff City i-Tree Eco Study undertaken in 2017, Cardiff has an estimated 1.4 million trees, which provide an estimated canopy cover of 18.9%. This canopy cover is unevenly distributed in Cardiff between different land classes, with a bias towards trees on private property[39]. Most of the canopy cover is within the north

[37] https://www.cardiffldp.co.uk/wp-content/uploads/Constraint-Plan.pdf
[38]https://www.cardiffnewsroom.co.uk/releases/c25/28723.html#:~:text=New%20analysis%20carried%20out%20by%20independent%20charity%20Fields,2682%20hectares%20%28the%20equivalent%20of%203756%20football%20pitches%29.
[39]https://www.forestresearch.gov.uk/research/i-tree-eco/i-tree-eco-projects/i-tree-eco-cardiff/#:~:text=Cardiff%20has%20an%20estimated%201.4%20million%20trees%2C%20which,with%20a%20bias%20towards%20trees%20on%20private%20property

of Cardiff, which tends to have more trees in private ownership. The south of Cardiff (including the city centre) has a higher population but receives fewer benefits from having fewer trees. The study found that Cardiff's urban forest is vulnerable due to the dominance of by two species (sycamore and ash) which can make it less resilient to pest and disease outbreaks.

Transport Corridors

3.2.31 The main road network is the M4 motorway crossing east to west within the northern part of the county area. Cardiff is served by active railway lines but these along with disused corridors contribute to the GI network. Other major trunk roads include A48, A4232 and A470.

3.2.32 These transport routes may form important wildlife corridors through Cardiff. Features relating to this infrastructure such as railway tunnels and bridges also provide habitats for wildlife. Wide roads could also fragment habitats however and affect the dispersal of wildlife in a particular area.

3.2.33 An extensive network of public rights of way provides a range of sustainable access routes for people (non-motorised users) across Cardiff. It enables movement between settlements and GI assets, to the wider countryside and to amenities beyond the county boundary. This network is complemented by permissive paths, short and long-distance trails, and a national cycle route. Cardiff Bay Trail encircles and links with the Wales Coast Path.

3.2.34 Active travel routes in Cardiff are shown on Drawing Number CA12850-063.

3.3 Summary – Overview of Strategic Cardiff GI

3.3.1 The above grouped together represent the County's existing GI resource. The GI plans only provide information on GI assets within Cardiff, but it should be recognised that some 'landscape-scale' assets extend across administrative boundaries, such as woodlands, and the coastline. It is therefore of primary importance that GI is strategically planned to provide a comprehensive and integrated network at the strategic scale. Existing Cardiff GI at a strategic level is shown on Drawing Number CA12850-030. Detailed baseline layers of existing GI assets differentiating between designated sites, accessible open space and river/ transport corridors are shown on detailed drawings at a ward level provided in Appendix 2.

3.3.2 The overview GI assets plans highlight the following areas of GI fragmentation (although this list is not exhaustive):

- Isolation of pockets of woodland in the north-east of Cardiff and to the north of the M4 corridor;
- Lack of open space and tree cover in south Cardiff;
- Isolated parks and open spaces surrounded by built development in urban areas;
- Lack of GI within existing industrial areas;
- Coastal habitats restricted / fragmented by docks and industrial areas;
- The corridor of the River Taff narrows along its southern section through the city centre to Cardiff Bay;
- Habitats along the River Ely and Roath Brook are narrow and disconnected along some sections; and
- Major A-roads through Cardiff fragment or have a lack of existing GI e.g. Newport Road, A48, A470.

3.4 Summary - Threats to Ecosystems in Cardiff

3.4.1 Based on information provided with the SoNaRR 2020, the main pressures identified for each of Cardiff's broad ecosystems are presented in Table 3. Details on the specific impacts relating to these threats can be reviewed within the SoNaRR 2020 report.

3.4.2 The pressures and threat to ecosystems are varied but with some common themes across them.

Table 3: Pressures affecting the Condition of Ecosystems in Cardiff							
Broad Ecosystem Class	**Woodland**	**Semi-Natural Grassland**	**Enclosed Farmland**	**Coastal Margins**	**Open Water, Wetlands and Floodplains**	**Urban**	**Marine**
Pressure							
Climate Change							
Changing weather patterns	✓	✓	✓	✓	✓	✓	
Rising sea level			✓	✓		✓	✓
Increased water temperature					✓		✓
Ocean acidification							✓
Pollution							
Air pollution (transport/industry/certain farming practices)	✓	✓	✓	✓	✓	✓	
Water pollution (sewage/waste water discharge road/ contaminated land runoff)			✓	✓	✓	✓	✓
Land pollution (chemical/nutrient)			✓			✓	
Noise pollution						✓	
Land Use Change							
Agriculture Intensification		✓	✓	✓	✓		
Insufficient /Inappropriate Management	✓	✓		✓			
Built development and infrastructure	✓	✓	✓	✓	✓	✓	
Competing Land Use	✓	✓	✓				

Unmanaged access, sport and recreational activity		✓		✓			✓
Historic inappropriate afforestation				✓			
Physical modifications (preventing natural functioning of habitats/interruption of natural succession)				✓	✓		
Invasive Non-Native Species (INNS) (pests and diseases)	✓	✓	✓		✓	✓	✓
INNS (herbivore pressure)	✓						
Over exploitation							
Agriculture Intensification			✓				
Water demand					✓		
Insufficient management	✓				✓		
Unsustainable fisheries							✓
Demands placed on other ecosystem services						✓	

4 STAGE 2: IDENTIFYING PRIORITIES

4.1.1 GI can contribute to many roles and this Chapter outlines the key priorities in Cardiff that can be tackled in whole or in part through strategic GI. Key risks and issues identified in the South Central Area Statement for each ecosystem relevant to Cardiff have been set out in Section 3.

4.1.2 The challenge for delivering multifunctioning GI for communities is establishing what are the key threats to ecosystems in a particular area and the priorities for delivery of healthier places.

4.2 Priorities for Delivering Healthier Spaces in Cardiff

4.2.1 Several issues identified for ecosystems in Table 3 in the previous section are also key issues to be addressed to provide healthier spaces for communities.

4.2.2 Exposure to outdoor air pollution effects health and tend to be greatest in areas where due to social deprivation people can be in a less favourable situation to cope with the adverse effects of air quality. In the long term a reduced life expectancy can be associated with areas exposed to greatest levels of air pollution.

4.2.3 Noise exposure can affect people in terms of annoyance causing stress and /or sleep disturbance, adversely affecting mental health and well-being. Noise can also affect the tranquillity of spaces accessed by people.

4.2.4 Climate change can cause risks to food security (drought). Extreme rainfall events can cause flooding which events can cause risk to life but also cause distress to residents and businesses, from flooding of properties, transport networks and pavements. Flooding can also damage the natural and historic environment and can cause economic damage. Flooding can also influence the water quality of waterbodies. Climate change can also contribute to the Urban heat island (UHI) effect. This can be a significant issue during heat waves and outdoor thermal comfort (OTC) is also an important health and well-being factor for people using urban areas.

4.3 Identification of Priority Areas in Cardiff and how GI can tackle this

4.3.1 As part of the GIA, datasets around the main socio-economic factors and environmental challenges in Cardiff have been reviewed to identify priority areas where GI could be used to target the key threats and pressures to ecosystems and the services they provide as listed in Table 3 in the previous section.

4.3.2 Key priorities identified in Cardiff that GI could be used to help address are:

- Habitat Network Connectivity – Fragmentation and Damage to Habitats and Wildlife Corridors;
- Socio-economic factors;
- Inequalities – Social Deprivation;
- Air Quality;
- Noise Pollution; and
- Flood Risk Areas.

Habitat Network Connectivity - Fragmentation and Damage to Habitats and Wildlife Corridors

4.3.3 Urban development, if left unchecked at a strategic level, can fragment habitats and isolate species which use them.

4.3.4 There is also a risk that if suitable GI is not provided as part of new developments for recreation and sporting activities, impacts to sites designated for their conservation value could result in a reduction in their condition, reducing ecosystem resilience. For example, Cardiff Beech Woods SAC has suffered damage from biking activity. Damage to habitats can affect the flora and fauna using them causing declines in their populations and ranges.

4.3.5 INNS outcompete and displace native species reducing ecosystem resilience which leads to a loss of biodiversity including species which are already identified as priority species of biodiversity value. UK INNS tend to be better adapted to extreme climate conditions which can have issues for stability of ecosystems long term.

4.3.6 Examples of INNS present in Cardiff include:

- Zebra mussels within Cardiff Bay have caused weakening of port structures (including pipes, marine architecture) thereby causing an economic impact in terms of replacing damage and from the cost to remove then annually from the Bay;
- Killer shrimps in Cardiff Bay are outcompeting native shrimp and fish;
- American mink is an INNS which preys on native water voles along Cardiff river systems; and

- Japanese knotweed, Himalayan balsam and giant hogweed[40] are also INNS found particularly along transport routes and river corridors. Again, these species can outcompete native species, but their eradication can be costly. Japanese knotweed can also cause physical damage to property.

4.3.7 Key priorities for maintaining habitat connectivity networks in Cardiff are maintaining, managing appropriately and improving the condition of the current network of statutory and non-statutory site (with appropriate protective buffers in place) and maintaining/managing existing habitats links between these areas, creating new habitat links and providing suitable alternative areas of greenspace for recreational purposes in new developments. There is a need for GI to contribute to all the above in Cardiff.

Socio-Economic Factors

4.3.8 GI in urban areas can contribute to alleviating demands from an increasing population. Increasing tree cover, particularly in densely populated less affluent areas , would have multiple benefits such as reducing flood runoff, providing shade, reducing summer temperatures, filtering dust and pollution and increasing biodiversity. GI also has a role to play in managing an increase in waste and pollution from an increasing population.

4.3.9 GI can also contribute to improving the health and wellbeing of urban residents by providing a variety of spaces where residents can connect with nature and areas where exercise and recreation can take place. There is a need for accessible natural greenspace in Cardiff in areas not currently well provided for, as well as in new housing developments. Active travel routes combined with GI, where possible, will also assist with improving the health and wellbeing of urban residents as they move about the city.

[40] Species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)

Inequalities – Social

4.3.10 Cardiff has some of the most deprived wards in Wales based on the Wales Index of Multiple Deprivation. If there is insufficient GI in a neighbourhood, communities could feel isolated and unconnected to the natural world and would be excluded from the benefits that high quality GI can deliver in terms of mental and physical well-being and stress reduction.

4.3.11 The local communities in these areas would benefit from an increase in GI such as urban greening, in particular an increase in canopy cover provided by suitable deciduous trees (this would also alleviate urban heat island effects), installation of SuDs and creation of and improved access to greenspaces. There is a need for GI in these existing residential areas.

Air Pollution – Air Quality Management Areas

4.3.12 Cardiff has the highest levels of nitrogen dioxide (NO2) and particulate matter pollution in Wales and there tends to be an association with higher levels of air pollution and deprivation. Air Quality Management Areas (AQMAs) are declared where the air quality objectives as set out in regulations are not likely to be met. Four AQMAs have been identified in Cardiff (refer to Drawing Number CA12850-033 for approximate locations) because of excessive levels of the pollutant NO2 associated with road transport[41]:

- Ely Bridge AQMA
- Stephenson Court AQMA
- Llandaff AQMA
- Cardiff City Centre AQMA

4.3.13 Particulate matter (PM) which are small particles of pollution in the air are also generated as a result of transport, but other gaseous sources of air pollution include industry, agriculture, aviation, shipping and domestic solid fuel.

4.3.14 There is a need to increase GI in the AQMAs to assist with improving air quality. GI in Cardiff can also contribute to reducing air pollution citywide from road transport

[41] https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=394

through appropriate planting which can provide buffers to sensitive areas e.g. school outdoor areas, by filtering and intercepting harmful particulates.

4.3.15 There is a need to improve provision of active travel links as part of greenspace provision which could assist with reducing polluting vehicle trips as well as contributing to exercise and health objectives. However, the provision of active travel links must balance with their impacts on greenspaces.

Noise Pollution

4.3.16 Noise pollution is subjective and can adversely affect a person and wildlife at differing degrees.

4.3.17 Providing high quality GI locally can attract local residents to use spaces on their doorstep, thus reducing transport trips would reduce also impacts from noise pollution. GI can also provide buffer zones between noise generating sources e.g. industrial/commercial noise in urban areas and noise sensitive receptors e.g. residential properties.

Flood Risk Areas

4.3.18 Cardiff Council are the Lead Local Flood Authority (LLFA) and has statutory responsibility for managing flood risk from surface runoff, ground water and ordinary watercourses (referred to as local flood risk sources). Flooding presents a risk to people and property and economic activity.

Risk to People and Property

4.3.19 The Cardiff Flood Risk Management Plan 2015 states that 80% of residential properties in 2015 are located within a Flood Risk Area.

4.3.20 The Flood Risk Plan completed a high-level assessment of the economic impact of flood damage, and it was estimated that each year the area of Cardiff could incur over 26 million worth of damage.

4.3.21 Cardiff lies within the catchment for the River Severn and is included in the South East Valleys Catchment Management Plan. The LLFA also has to provide an effective and sustained response to coastal erosion events They have a duty to prioritise investment in the most at-risk communities. An aspect of their work it to collaborate with other partners to improve residence with the community including Cardiff Area Flood Group and Severn Estuary Coastal Group.

4.3.22 A high-level Flood Consequences Assessment of the Wentloog Levels did not identify a significant risk of flooding due to its active management by the Caldicot & Wentloog Levels Internal Drainage Board.

4.3.23 GI can assist with reducing flood risk. There is a particular need for this type of GI within the identified flood zones in Cardiff. The flood zones for Cardiff at a strategic level are shown on the Strategic Flood Zones Plan (Drawing Number CA12850-065).

4.4 How GI can address Existing Pressures on Cardiff

4.4.1 Table 4 sets out how GI could tackle and resolve the key pressures in Cardiff and summarises the ecosystem services they can deliver.

Table 4: Roles of GI

Key Pressures	Role of GI	Benefits delivered	Ecosystem Services Delivered
Socio-Economic	Provide well connected green spaces – Active Travel Routes. Create high quality urban spaces including well designed GI.	Reduce reliance on transport to visit spaces further afield – also reduces noise /air pollution from transport sources. Provides exercise opportunities. Drives up market conditions for the residential and commercial sectors, attracting business opportunities for redevelopment, jobs, investment and other key service areas e.g. tourism which can draw visitors away from sites which are designated for their nature conservation value, and could alleviate recreational pressures /damage to such sites.	Cultural
Reduce Noise Pollution	Reduce reliance on transport - reduces noise pollution.	Improves soundscapes. Provide relaxing and peaceful areas within an urban environment or areas	Regulating Cultural

	Provides sound attenuation within environments, scattering and reducing the perception of noise within an area. Provide a buffer between the noise receptor and the noise source.	which can be accessed for sports and recreation, improving health of the community and their resilience to noise pollution.	
Climate Change	Sequestration of carbon dioxide. Minimise the impacts from Heat Island Effect in urban areas.	Aids reversing the impacts of climate change. Preventing rising sea levels/coastal erosion of habitats and reducing flood risk. Helps alleviate extreme temperatures through the process of evapotranspiration and can cool areas in the vicinity of the GI reducing the neighbourhoods need for increased energy consumption to keep cool using air conditioning (e.g. canopy of trees and vegetated walls).	Regulating
Air pollution	Filtering out particulates	Improves human heath	Regulating
Increase in Biodiversity	Provides habitats for protected and species of biodiversity value. Provides foraging and commuting routes, allowing species to increase	Ecologically rich habitats and native species diversity can be increased, and resilience of ecosystems can be improved to deal with future climatic changes. GI in urban areas provides 'stepping stone' habitat for species to connect to rural areas and designated sites.	Regulating Supporting Services

	their range and population site.		
Flood Risk and Reduced Water Quality	Sustainable urban drainage/nature-based solutions	Which reduce the flow rate of water travelling through a catchment and water quality of watercourses can be improved through the capture of surface water runoff and storage within green spaces prior to its release. Improve biodiversity and ecosystem resilience.	Provisioning Regulating Supporting Services
Competing Land Use	Examples – grassland around Solar photo-voltaic farms can help with the climate and biodiversity emergencies but should be on land that is not of high quality for food production. Careful consideration whether tree planting or restoration of grassland is best in a location.	The decisions around the role of GI will have to consider the priorities for an ecosystem service in a particular location and land use/history/ designation etc.	Provisioning Regulating Cultural Supporting Services

4.5 Strategic GI Needs in Cardiff

4.5.1 To address the key priorities affecting people and ecosystems in Cardiff, the following needs for strategic GI have been identified issues: maintain and improve the habitat connectivity network, improve air and water quality, reduce flood risk, provision of adequate accessible greenspace, provision of active travel routes, designing appropriate GI into new housing and employment developments, incorporating GI

into existing residential and employment areas and incorporating urban greening in socially deprived areas.

4.5.2 Opportunities in Cardiff where GI can address these needs are discussed in the next section.

5 STAGE 3: IDENTIFYING OPPORTUNTIES

5.1 Opportunities to tie in with on-going Strategic projects

5.1.1 Six cycleways are being developed in Cardiff with destinations from the city centre to Roath Park, Northeast Cardiff, St Mellons Business Park, Cardiff Bay, Northwest Cardiff and Caerau[42]. Future active travel routes are also planned – see Drawing Number CA12850-063.

5.1.2 The proposed cross rail/ metro links in Cardiff could be used to provide connectivity/stepping stone linkages.

5.1.3 A 10 -year programme known as Coed Caerdydd has been in place as part of the city's One Planet Climate Change Strategy which aims to increase the cover of trees within the city from 18.9% to 25%[43].

5.1.4 SuDs have already been introduced by Cardiff Council into Grangetown and Central Square (Wood Street).

5.1.5 Options can be explored to maximise habitat restoration/creation relevant to each Cardiff Nature Recovery Zone & Resilient Ecological Network which are areas identified by the Cardiff LNP as part of Cardiff's NRAP - refer to Drawing CA12850-034/B.

- Cardiff City Nature Recovery Zone
- North Cardiff Woodlands Nature Recovery Zone
- Gwent Levels Resilient Ecological Network
- Cardiff City Resilient Ecological Network

5.1.6 Ten council-owned green spaces are protected from development in perpetuity as Fields in Trust. These include Alexandra Gardens, Grange Gardens, Heath Park, Hywel Dda Open Space, Llanishen Park, Moorland Park in Splott, Pontcanna Fields, Pontprennau Fields, Roath Recreation Ground and Rumney Recreation Ground.

5.1.7 Two other green spaces in Cardiff, managed by local Community Councils are also protected by Fields in Trust. They are Creigau Recreation Ground and Old St Mellons

[42]https://www.cardiff.gov.uk/ENG/resident/Parking-roads-and-travel/travel/cycle-super-highways/Pages/default.aspx
[43] https://www.oneplanetcardiff.co.uk/

Playing Field. Cardiff Council are looking to identify further parks and spaces which could be placed under the charity's permanent protection.

5.1.8 Cardiff Council have introduced one-cut grassland areas in public parks. These areas could be expanded and introduced in other appropriate locations.

5.2 Strategic GI Opportunity Areas

5.2.1 Cardiff has been split into four strategic GI opportunity areas which are:

- Farmlands, Woodlands & Rural Settlements;
- Urban;
- River Corridor; and
- Coastal.

5.2.2 These main GI opportunity areas comprise a number of GI zones or corridors which have been grouped based on each zones' specific needs for GI which was informed by a detailed assessment of GI opportunities available within each ward. These are shown in Table 5 along with the wards that are applicable to each GI zone and on Drawing Number CA12850-066.

Table 5 – Strategic GI Opportunity Areas

Strategic GI Opportunity Area	GI Zones / Corridors	Applicable Wards
A. Farmlands, Woodlands & Rural Settlement GI Zone	A1 - Western Cardiff	Pentyrch and St Fagans Radyr and Morganstown
	A2 - Northern Cardiff	Whitchurch and Tongwynlais (North) Rhiwbina (North) Lisvane and Thornhill (North) Pontprennau and Old St Mellons (North)
B. Urban GI Zones	B1 - Outer Cardiff (West)	Fairwater Ely Caerau Canton
	B2 - Cardiff Centre	Riverside Cathays Grangetown Butetown Adamstown

		Splott Plasnewydd
	B3 - Northwest Cardiff	Llandaff Llandaff North
	B4 - Outer Cardiff (North)	Whitchurch and Tongwynlais (South) Rhiwbina (South) Lisvane and Thornhill (South) Pontprennau and Old St Mellons (South) Llanishen
	B5 - North Cardiff	Gabalfa Heath
	B6 - Northeast Cardiff	Cyncoed Penylan Pentwyn
	B7 - Outer Cardiff (East)	Llanrumney Rhymney Trowbridge
C. River GI Corridor	C1 - Ely	Pentyrch and St Fagans Ely Fairwater Caerau Canton Grangetown
	C2 - Taff	Whitchurch and Tongwynlais Radyr and Morganstown Llandaff North Llandaff Gabalfa Riverside Cathays Grangetown Butetown
	C3 - Rhymney	Pontprennau Pentwyn Llanrumney Penylan Rumney Splott
	C4 – Other watercourses	Pentyrch and St Fagans

		Whitchurch and Tongwynlais Lisvane and Thornhill Cyncoed Plasnewydd Penylan Splott Pentwyn Pontprennau and Old St Mellons Rumney Trowbridge
D. Coastal GI Zones	D1 -Gwent Levels - Wentloog	Trowbridge Rumney
	D2 – Industrial / Dock Areas	Grangetown Butetown (West)
	D3 – Cardiff Bay	Butetown (East) Splott

5.2.3 Tables 6-9 set out opportunities to expand and incorporate GI within each zone based on the specific needs for GI at each zone including where gaps and/or deficiencies in GI have been identified and where a particular need for GI is required for the habitat connectivity network, air pollution, flood risk, noise, accessible natural greenspace, active travel routes, housing and employment land (existing and future), urban greening and water quality.

Table 6: GI Opportunity Area A. Farmlands, Woodlands & Rural Settlements GI Zone

		GI Zones		Contribution to GI Themes					
GI Need	**GI Opportunities**	**A1 – Western Cardiff**	**A2 – Northern Cardiff**	**Health & Wellbeing**	**Biodiversity and Ecosystem Resilience**	**Climate Change & Sustainability**	**Social Cohesion**	**Economy**	**Sense of Place**
Habitat Network Connectivity	Protect and strengthen buffers to Cardiff Beech Wood SAC and woodland SSSIs. New woodland creation.	✓	✓		✓	✓			✓
	Improve condition of Cardiff Beech Wood SAC (currently unfavorable) and woodland SSSIs. Refer to Table 2.	✓	✓		✓	✓			✓
	Protect and strengthen buffers to SINCs, other nature conservation designations and ancient woodland.	✓	✓		✓	✓			✓
	Aim to link nature conservation designations and areas of ancient woodland, open spaces, ponds and grassland to each other and to existing corridors such as M4 motorway, watercourses and disused railways.	✓	✓		✓	✓			✓
	Farmland – opportunities to create wildlife strips/corridors alongside field margins and watercourses. Hedgerow planting along field boundaries. Sympathetic	✓	✓		✓	✓			

	management of hedgerows for wildlife, particularly in areas known to support dormouse.								
	Non designated open space/park/sports – strengthen habitats (ponds, taller grass, tree lines) around the periphery and sympathetic management (expand one cut grass).	✓	✓		✓	✓			✓
	Public buildings, allotments, golf course, St Fagans National Museum of History – explore opportunities to provide enhancements for biodiversity e.g. green roofs and walls.	✓	✓		✓	✓			✓
	INNS control along railways and watercourses.	✓	✓		✓				
Flood risk	River corridors and Flood Zones – improve physical attributes/introduce SuDs/wetlands/wildlife ponds/scrapes/ expand tree/grassland habitats.	✓	✓		✓	✓		✓	
	Target GI in Flood Zones including SuDs	✓	✓		✓	✓		✓	
Accessible Natural Greenspace	Maintain and manage Public Rights of Way across rural areas. Liaise with landowners regarding management along routes.	✓	✓	✓		✓	✓	✓	
	Create/strengthen routes between open spaces and to road, railway and river	✓	✓	✓		✓	✓	✓	

	corridors. Link/strengthen access routes to natural greenspace (including woodland and nature conservation designations) through residential areas and rural areas.								
Active Travel Routes	Progress the future active routes as shown on Drawing Number CA12850-063.	✓		✓		✓	✓	✓	
	Explore further opportunities to upgrade existing Public Rights of Way (PRoWs) to official Active Travel Routes and improve route connections (disused railway lines), linking rural settlements and to routes into the city centre.	✓	✓	✓		✓	✓	✓	
Housing & Employment Land – Existing and Future	Explore opportunities to create suitable alternative natural greenspaces spaces as part of new developments to alleviate the recreational pressures on the Cardiff Beech Wood SAC and other nature conservation designations/ ancient woodland.	✓	✓	✓	✓	✓	✓	✓	✓
	Opportunities to design high quality GI into new developments.	✓	✓	✓	✓	✓	✓	✓	✓
	Opportunities to increase GI in existing residential areas (see Table 11).	✓	✓	✓	✓	✓	✓	✓	✓
	Opportunities to increase GI in existing industrial areas (Table 11).	✓	✓	✓	✓	✓	✓	✓	✓

Table 7: GI Opportunity Area B. Urban

		GI Zones							Contribution to GI Themes / Ecosystem services					
GI Needs	**GI Opportunities**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**Health & Wellbeing**	**Biodiversity and Ecosystem Resilience**	**Climate Change & Sustainability**	**Social Cohesion**	**Economy**	**Sense of Place**
Habitat Network Connectivity	Protect and strengthen buffers to SSSIs, LNRs, SINCs, other nature conservation designations and ancient woodland.	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓
	Opportunities to provide 'Stepping Stone' habitats / SuDs / ponds to create biodiversity linkages between parks and open spaces. Create/strengthen linkages between opens spaces and to M4 and railway corridors. Strengthen existing links through residential	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓

	areas and along watercourses.												
	Non-designated open space/park/sports – opportunities to increase areas of one-cut grassland, sympathetic habitat management, hedgerow and other boundary planting. Incorporate more tree-lined boundaries, biodiverse beds/wetlands, ponds, pocket tree plantings with seating.	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓
	Public buildings – schools, hospitals, allotments, golf courses, cemeteries – explore opportunities to provide enhancements for biodiversity e.g. green roofs and walls.	✓	✓	✓	✓	✓	✓	✓		✓	✓			

	INNS control along railways and watercourses.	✓	✓	✓	✓	✓	✓	✓						
Air Quality	Cardiff AQMAs – target tree planting to help filter particulates. Use a range of native species.	✓	✓	✓					✓	✓	✓		✓	
	Increase boundary planting at schools and playgrounds and other sensitive sites.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
Flood risk	Target GI in Flood Zones including SuDs.	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	
	Explore options to restore physically modified watercourses to replicate natural process, open up more waterways which may have been covered/culverted within urban areas. Explore features that can be incorporated into	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	

	watercourses to slow water flow.													
Accessible Natural Greenspace	Explore creating wildlife and gardening areas for outside learning at schools.	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
	Create community gardens, woodlands, orchards and ponds in existing areas of non-designated open space of low ecological value e.g. amenity grassland.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Expand one-cut grassland areas.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Expand / increase biodiversity of grassland verges.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Active Travel Routes	Progress with the future active travel routes as shown on Drawing Number CA12850-063.	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Housing & Employment Land –	Opportunities to design high quality GI into new developments.	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓

Existing and Future	Create suitable alternative natural greenspaces in new developments to alleviate the recreational pressures on the Cardiff Beech Wood SAC, other nature conservation designations and ancient woodland.	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓
	Integrate and build water into design of new developments and any areas being regenerated.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Incorporate GI in to existing residential areas – see Table 11 for examples of GI.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Incorporate GI into existing industrial / commercial areas – see Table 11 for examples of GI.	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Urban greening	Target socially deprived areas with a lack of tree cover and other green areas – see Table 11 for examples of GI. Plant a wide range of native species.	✓	✓	✓			✓	✓	✓		✓	✓		✓

Table 8:GI Opportunity Area C. River Corridor

		GI Corridors				Contribution to GI Themes / Ecosystems Services					
GI Needs	**GI Opportunities**	**C1 - Ely**	**C2 - Taff**	**C3 - Rhymney**	**C4 - Other**	**Health & Wellbeing**	**Biodiversity and Ecosystem Resilience**	**Climate Change & Sustainability**	**Social Cohesion**	**Economy**	**Sense of Place**
Habitat Network Connectivity	Strengthen habitat buffers to river corridors.	✓	✓	✓	✓		✓	✓			✓
	Provide new habitat links to river corridors from designated sites, ancient woodland, open spaces and grassland.	✓	✓	✓	✓		✓	✓			✓
	Target tree planting/habitat creation where riverine habitats have been fragmented / squeezed. Provide areas of dense cover to provide otter resting opportunities.	✓	✓	✓	✓		✓	✓			✓
	INNS control along watercourses, where needed.	✓	✓	✓	✓		✓				
Air Quality	Improve management of existing GI along river corridors and increase planting, particularly trees, to support reduction of air pollution.	✓				✓	✓	✓		✓	
Flood risk	Improve physical attributes of rivers. Explore options to restore	✓	✓	✓	✓		✓	✓		✓	

	physically modified watercourses to replicate natural process, open up more waterways which may have been covered/culverted within urban areas. Explore features that can be incorporated into watercourses to slow water flow and decrease flood incidents further downstream.										
	Create wetlands, wildlife ponds and scrapes within river corridors. Opportunities within riverside SINCs.	✓	✓	✓	✓		✓	✓		✓	
	Expand tree / grassland areas within river corridors. Opportunities within riverside SINCs.	✓	✓	✓	✓		✓	✓		✓	
	Target GI e.g. SuDS in River Corridor and Flood Zones.	✓	✓	✓	✓		✓	✓		✓	
Accessible Natural Greenspace	Provide links and additional access points from residential areas to river corridors.	✓	✓	✓		✓		✓	✓	✓	
Active Travel Routes	Progress with future Active Travel Routes as shown on Drawing number CA12850-063.	✓		✓	✓	✓		✓	✓	✓	

Water Quality	Explore opportunities for restoring sections of the river corridor which have been physically modified by replicating natural processes and implementing nature-based solutions for improved water quality and quantity.	✓	✓	✓	✓	✓	✓	✓		✓	✓

Table 9: GI Opportunity Area D. Coastal

		GI Zones			Contribution to Ecosystem Services					
GI Needs	**GI Opportunities**	**D1 – Gwent Levels - Wentloog**	**D2 – Industrial / Dock Areas**	**D3 – Cardiff Bay**	**Health & Wellbeing**	**Bio-diversity and Ecosystem Resilience**	**Climate Change & Sustainability**	**Social Cohesion**	**Economy**	**Sense of Place**
Habitat Network Connectivity	Severn Estuary SAC/SPA/Ramsar/SSSI - extend and reconnect coastal habitats where possible.	✓	✓	✓	✓	✓	✓			✓
	Severn Estuary SAC/SPA/Ramsar/SSSI, Gwent Levels Rumney & Peterstone SSSI and SINC Designations– protect and buffer with appropriate habitats.	✓	✓	✓	✓	✓	✓			✓
	Gwent Levels Rumney & Peterstone SSSI - Strengthen buffers to ditches / reens / watercourses	✓				✓	✓			✓
	Gwent Levels Rumney & Peterstone SSSI - Improve management of ditches / reens / watercourses	✓				✓	✓			✓

	Gwent Levels Rumney & Peterstone SSSI – increase / manage appropriately suitable habitat and habitat linkages available for shrill carder bee.	✓				✓				✓
	Provide new habitat links between designated sites, ancient woodland, open spaces and grassland, and to river and railway corridors.	✓	✓	✓		✓	✓			✓
	INNS control	✓	✓	✓		✓				✓
	Sports/parks - explore options to expand One Cut grassland. Provide 'Stepping Stone' habitats/ SuDs to create biodiversity linkages or strengthen existing linkages between ancient woodland, parks and open spaces.	✓				✓				✓
Flood risk	Opportunities to Improve management of ditches / reens / watercourses.	✓		✓		✓	✓		✓	
	Create wetlands, wildlife ponds and scrapes within Rhymney river corridor. Opportunities	✓				✓	✓		✓	

	within Rhymney SINC and other adjacent SINCs.									
	Expand tree / grassland areas within river corridors. Opportunities within Rhymney and other adjacent SINCs.	✓				✓	✓		✓	
	Target GI including SuDs in Flood Zones.	✓				✓	✓		✓	
Accessible Natural Greenspace	Provide additional links/access points from industrial and residential areas to Wales Coast Path.	✓	✓	✓	✓			✓	✓	
	Maintain and manage coast path and PRoWs in good condition. Consider restricting access to paths only, where necessary, to prevent access and disturbance to sensitive areas i.e. high tide roosts.	✓			✓			✓	✓	
Active Travel Routes	Progress future active routes shown on Drawing Number CA12850-063.	✓			✓					
	Gwent Levels – Wentloog - Active Travel and Biodiversity – opportunities to improve	✓			✓					

	accessibility through the Gwent Levels and provide commuter links to Newport.									
Housing & Employment Land (Existing and Future)	Opportunities to design high quality GI into new developments.	✓			✓	✓	✓	✓	✓	✓
	Incorporate GI in to existing residential areas – see Table 10 for examples of GI.	✓			✓	✓	✓	✓	✓	✓
	Incorporate GI into existing industrial / commercial areas – see Table 10 for examples of GI.	✓			✓	✓	✓	✓	✓	✓
Water quality	Explore opportunities for implementing nature-based solutions for improved water quality along the coastline.	✓	✓	✓						

5.2.4 Examples of GI which can be incorporated into existing residential, industrial, infrastructure routes and commercial areas are listed in Table 10. These can also be incorporated into new developments.

Table 10: Examples of GI that can be incorporated into existing and future areas	
Housing Estates & School sites	• Gardens, allotments, and orchards • Sustainable drainage systems (SuDs) – (e.g. rain gardens, swales, attenuation ponds) • Biodiverse green roof (on commercial units or structures e.g. roofs of bus stops) • Hedgerows • Green screens and living walls (screening utilities cabinets, instead of fencing, screening areas which may be targeted by graffiti) • Street trees, grass verges within pavements, planter boxes • Parks, woodlands, wildflower grassland amenity space and natural play spaces • Butterfly banks • Footpaths and bridleways • Ponds, rivers and streams
Industrial Estates	• SuDs (rain gardens, swales, attenuation ponds) • Biodiverse Green roofs • Green screens and living walls (as above) • Vegetated earth banks/butterfly banks instead of bollards/fencing • Street trees, grass verges within pavements, planter boxes • Open mosaic habitat on brownfield sites
Infrastructure routes – e.g. Railways and roads	• Roadside verges, trees, planter boxes at stations • Railway /road embankments • Green bridges and tunnels • Green screens and living walls at stations/carparks • Hedgerows • Footpaths and bridleways
Commercial areas	• Biodiverse Green roofs and living walls • Street trees and planter boxes • Rain gardens • SuDs (rain gardens, swales, attenuation ponds) • Rivers and canals

6 STAGE 4: HOW GI CAN BE DELIVERED

6.1.1 The GIA can help inform future Strategies and Action Plans and GI Statements that are required to support planning applications.

7 STAGE 5: REVIEW OF THE RLDP GREEN INFRASTRUCTURE ASSESSMENT

7.1.1 In line with Planning Policy Wales, the Cardiff Green Infrastructure Assessment will need to be reviewed to ensure that information on habitats, species and other green features and resources is kept up to date, using the best data available. For example, when:

1. new data sets, plans or policies that informed the assessment are updated; and
2. monitoring highlights that the Assessment is not helping to achieve the desired results.

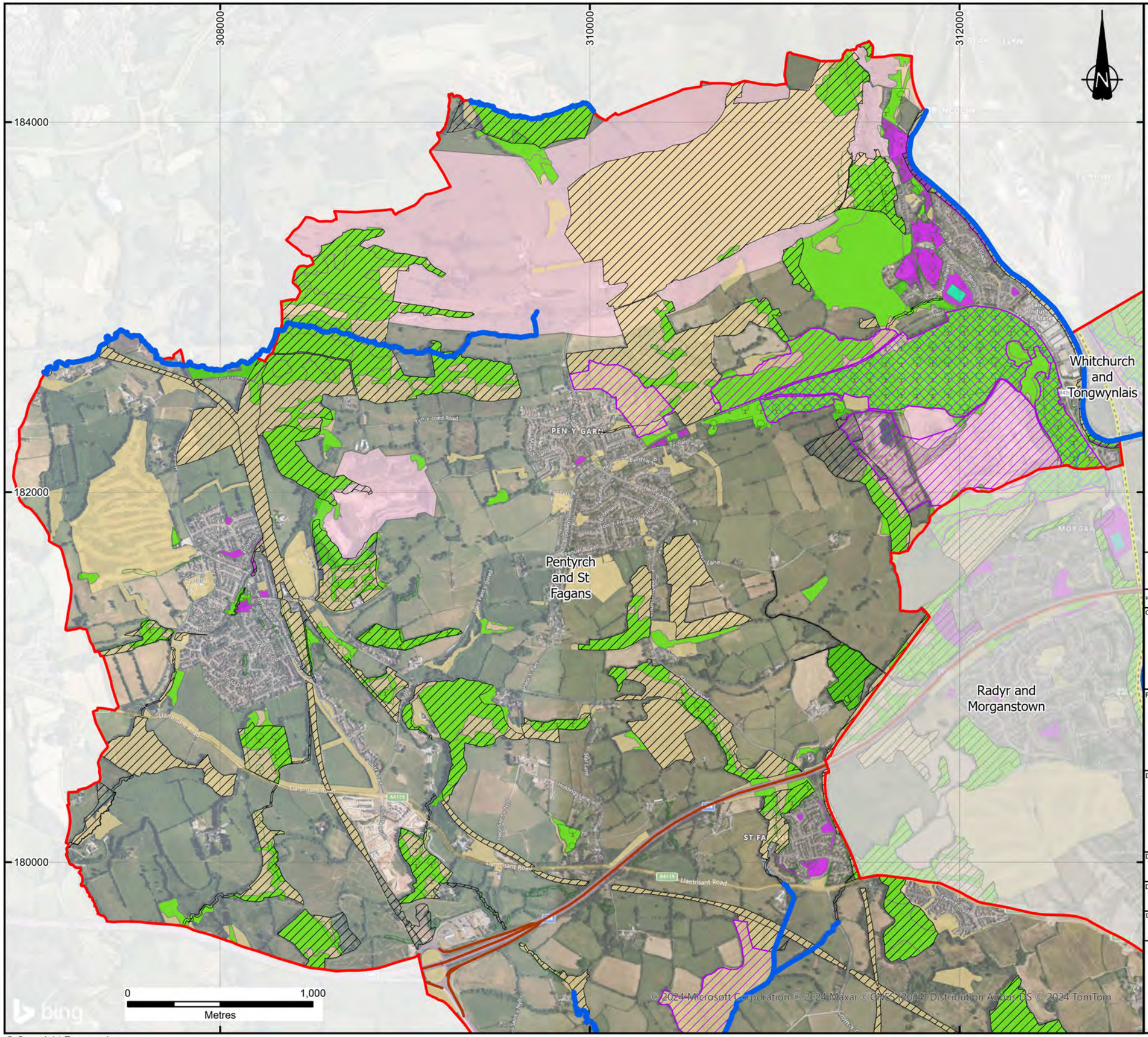
APPENDICES

Appendix 1

GIA 2024 – Data Set Summary

Appendix 2

GI Assets – Ward Maps



KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Special Areas of Conservation
- Regionally important geological and geomorphological sites
- Tree Preservation Order
- Ancient Woodland
- Sports Pitches
- Parks and Sports
- Open Space
- M4 Corridor
- Main Rivers
- Railway Corridor

Notes:
Boundaries are indicative. Aerial imagery shown for context purposes only.
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REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
A	FIRST ISSUE	11/12/24	RCB	AC	JH

CLIENT

CARDIFF COUNCIL

PROJECT

CARDIFF STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

PENTYRCH AND ST FAGANS WARD
PAGE 1 OF 2

DRG No.	REV	SUIT. CODE
CA12850-002	A	--

DRG SIZE	SCALE	DATE
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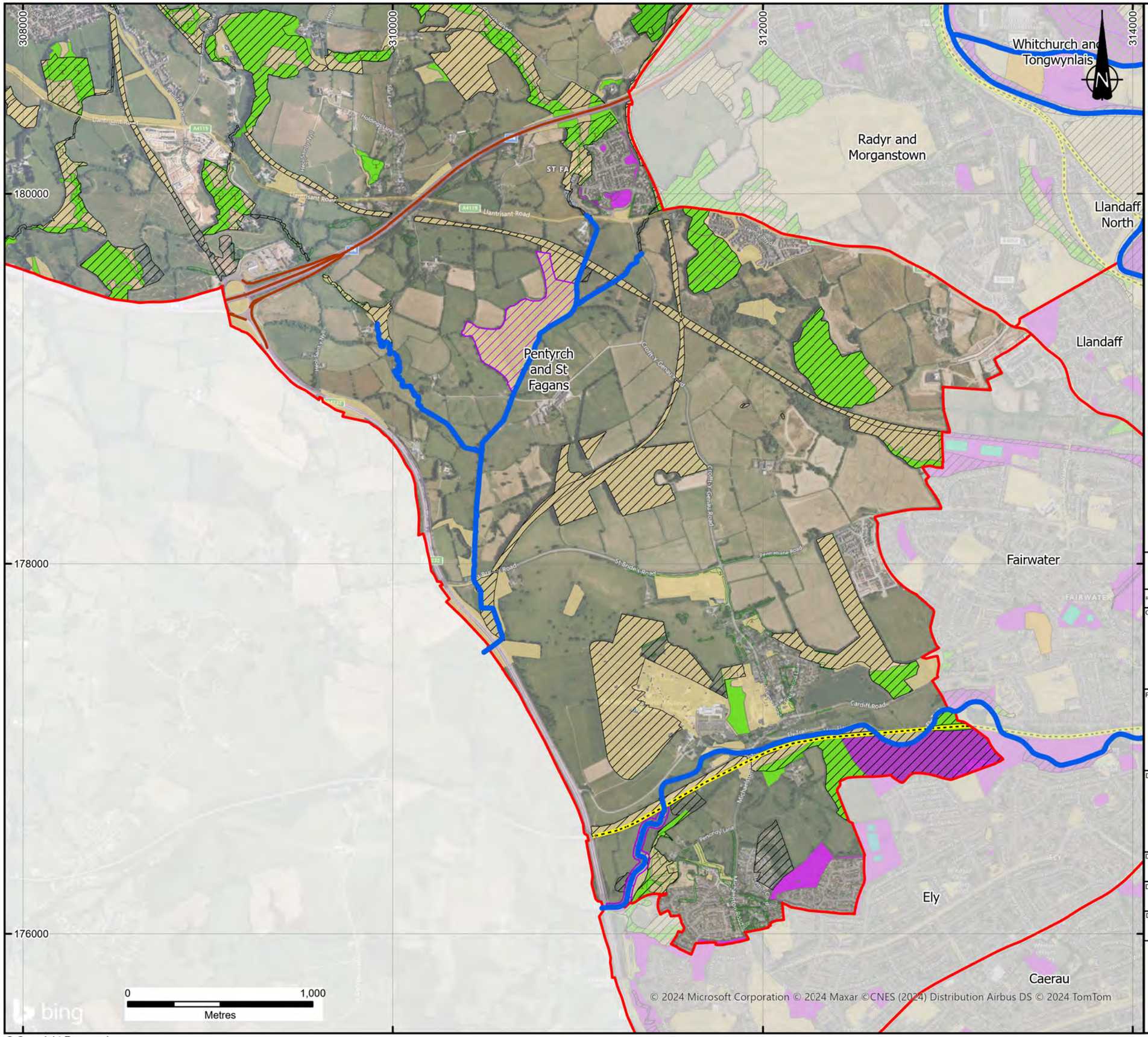
DRAWN BY	CHECKED BY	APPROVED BY
RCB	AC	JH

wardell armstrong
PART OF SLR



KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Regionally important geological and geomorphological sites
- Tree Preservation Order
- Ancient Woodland
- Sports Pitches
- Parks and Sports
- Open Space
- M4 Corridor
- Main Rivers
- Railway Corridor

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PROJECT

CARDIFF STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

PENTYRCH AND ST FAGANS WARD
PAGE 2 OF 2

DRG No.	REV	SUIT. CODE
CA12850-002	A	–

DRG SIZE	SCALE	DATE
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DRAWN BY	CHECKED BY	APPROVED BY
RCB	AC	JH

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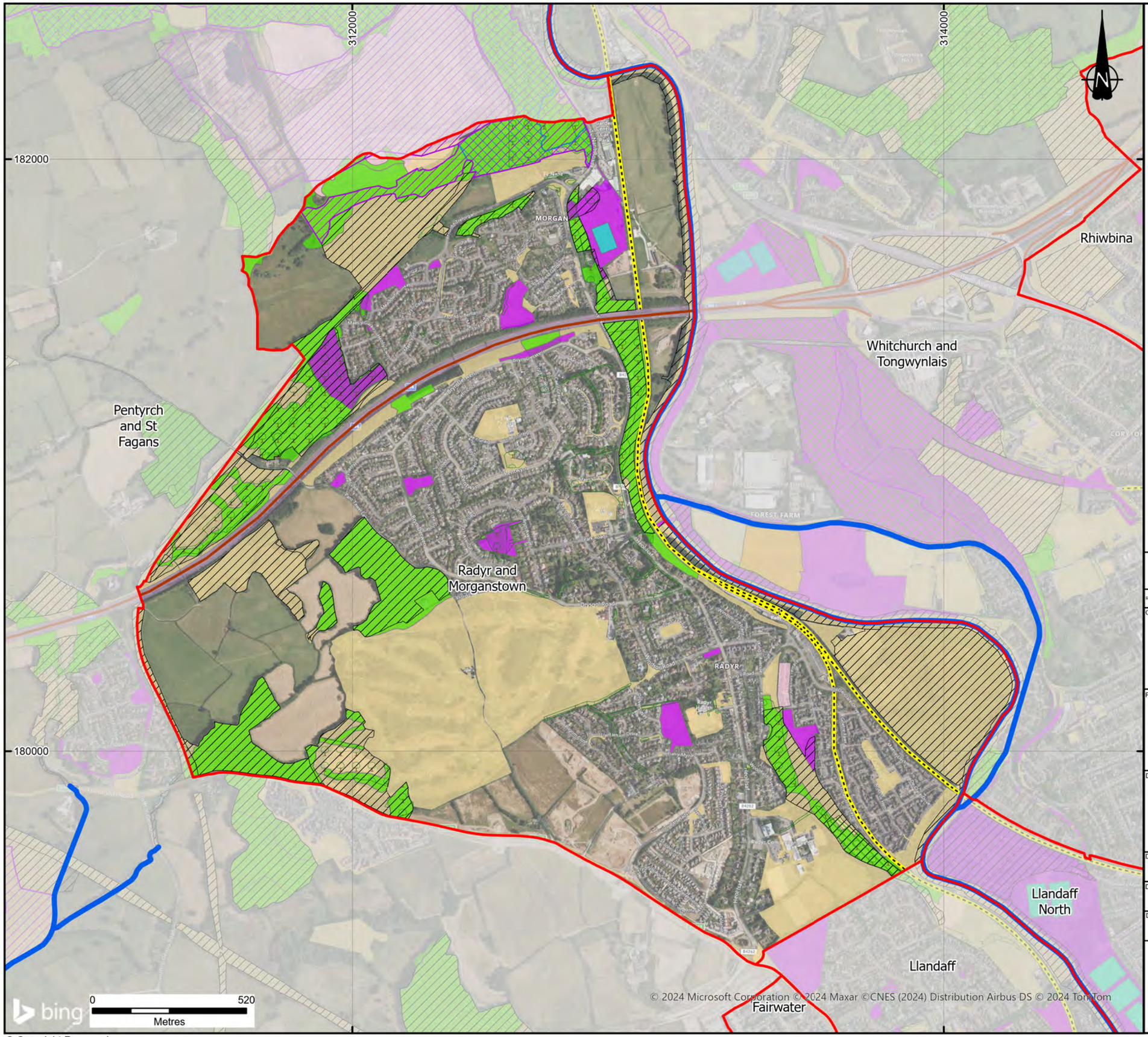
PART OF SLR



KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Special Areas of Conservation
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
- Sports Pitches
- Regionally important geological and geomorphological sites
- Parks and Sports
- Open Space
- Ancient Woodland
- Allotments
- Railway Corridor
- M4 Corridor
- Main Rivers

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REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D
A	FIRST ISSUE	11/12/24	RCB	AC	JH

CLIENT

CARDIFF COUNCIL

PROJECT

CARDIFF STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

RADYR AND MORGANSTOWN WARD

DRG No.	REV	SUIT. CODE
CA12850-003	A	--

DRG SIZE	SCALE	DATE
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DRAWN BY	CHECKED BY	APPROVED BY
RCB	AC	JH

wardell armstrong
PART OF SLR

313000
314000
315000
184000
183000
182000
Whitchurch and Tongwynlais
Rhiwbina
Pentyrch and St Fagans
Radyr and Morganstown
Tongwynlais No.2
Tongwynlais No.1
Greenmeadow Springs Business Park
0
500
Metres
bing
© 2024 Microsoft Corporation © 2024 Maxar ©CNES (2024) Distribution Airbus DS © 2024 TomTom

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Sites of Special Scientific Interest
- Special Areas of Conservation
- Local Nature Reserve
- Tree Preservation Order
- Parks and Sports
- Ancient Woodland
- Open Space
- Regionally important geological and geomorphological sites
- Railway Corridor
- Main Rivers
- M4 Corridor

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DRAWING TITLE

WHITCHURCH AND TONGWYNLAIS WARD
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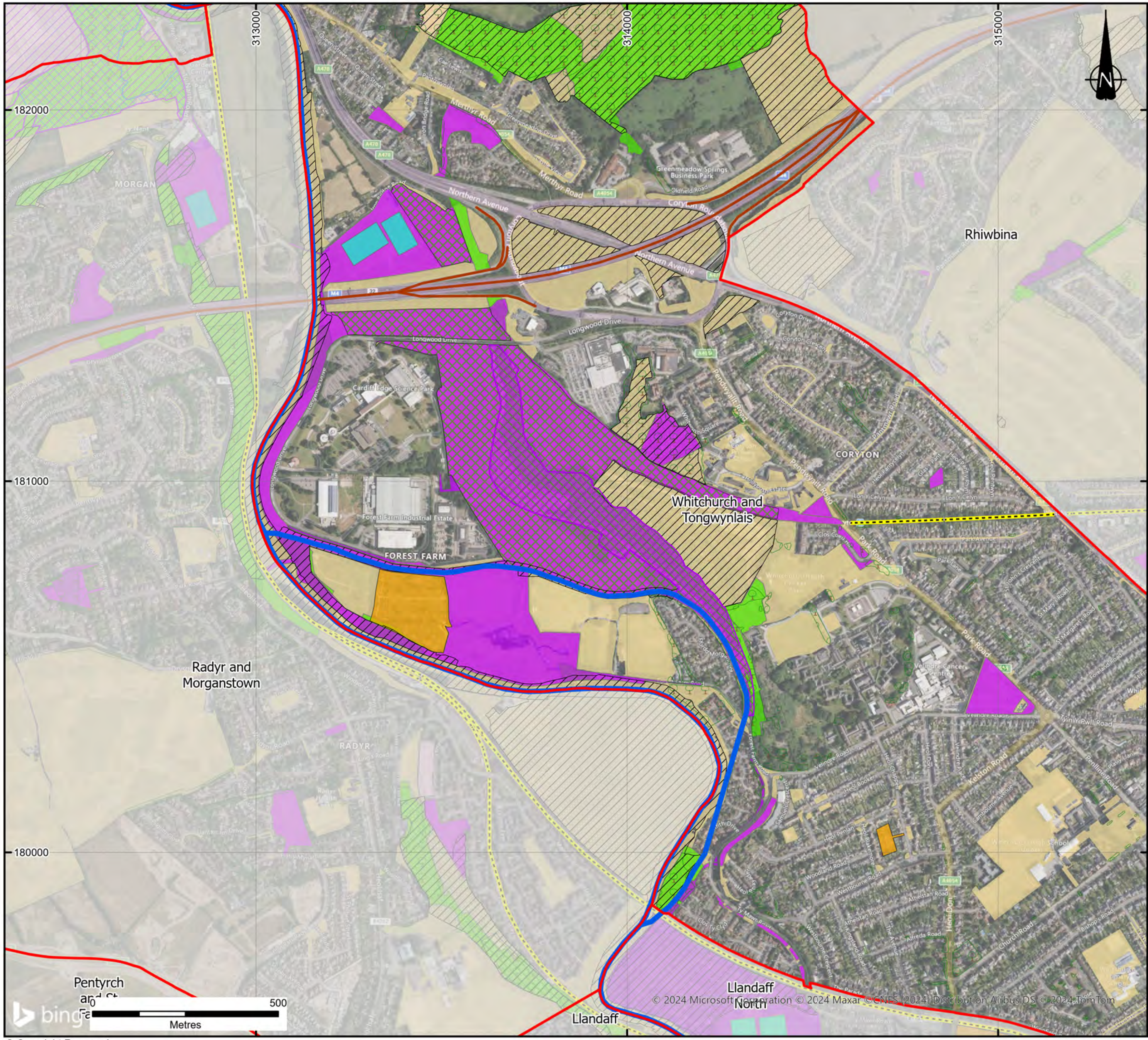

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Sites of Special Scientific Interest
- Special Areas of Conservation
- Local Nature Reserve
- Tree Preservation Order
- Sports Pitches
- Allotments
- Parks and Sports
- Ancient Woodland
- Open Space
- Regionally important geological and geomorphological sites
- Railway Corridor
- Main Rivers
- M4 Corridor

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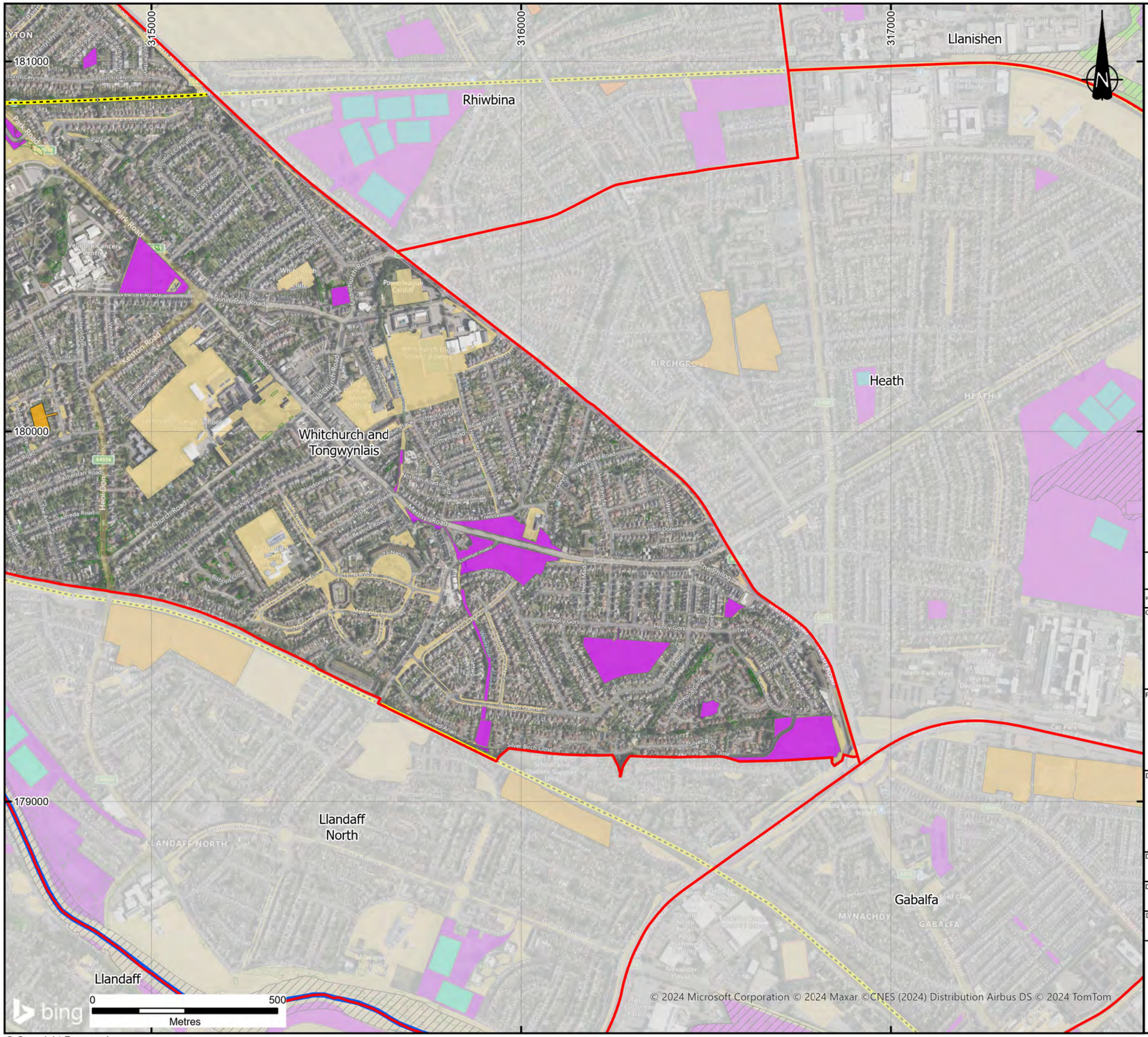

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Sports Pitches
- Allotments
- Parks and Sports
- Ancient Woodland
- Open Space
- Regionally important geological and geomorphological sites
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- Main Rivers

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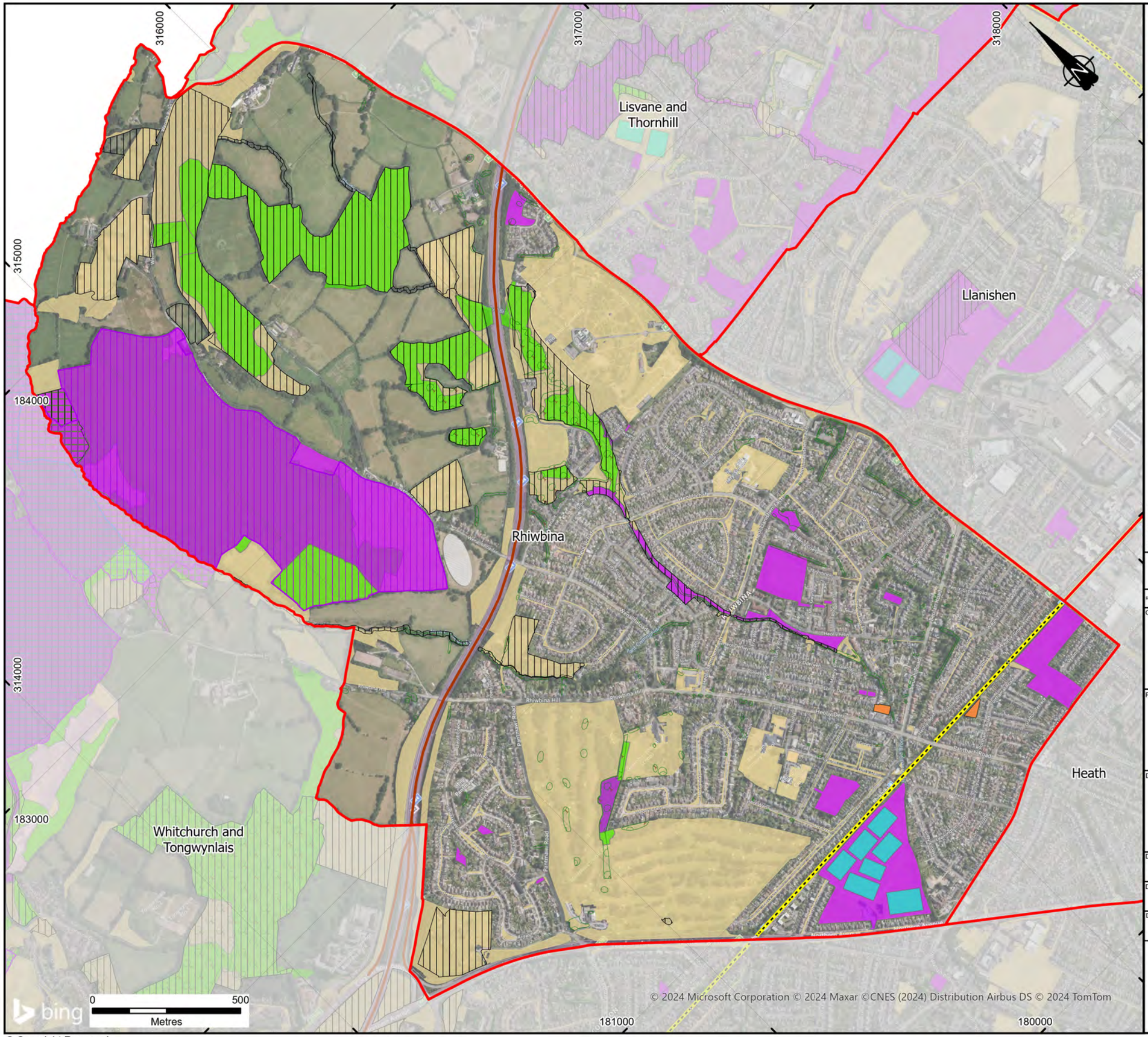

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Special Areas of Conservation
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
- Regionally important geological and geomorphological sites
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Allotments
- Railway Corridor
- M4 Corridor

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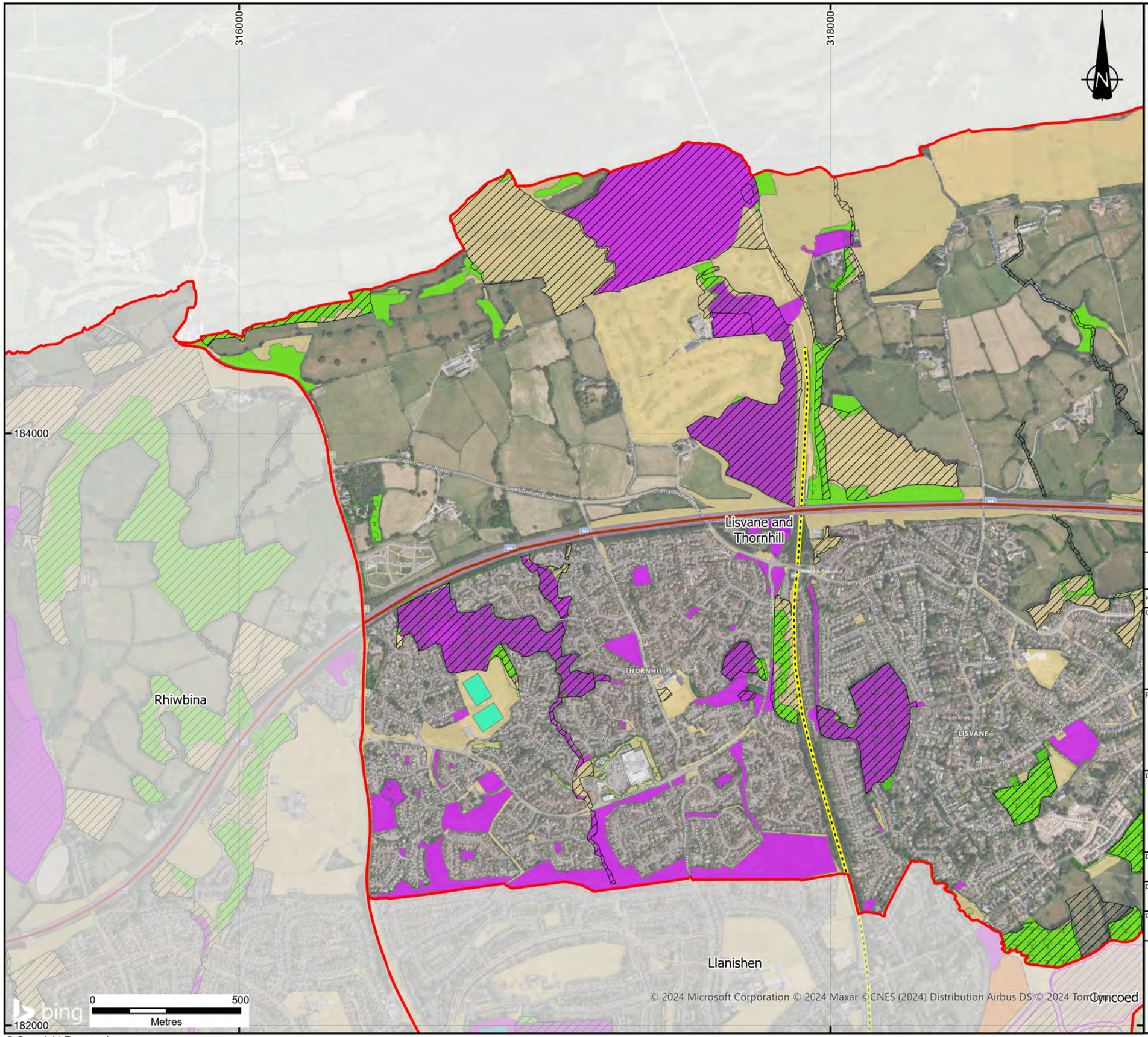

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
- Regionally important geological and geomorphological sites
- Open Space
- Ancient Woodland
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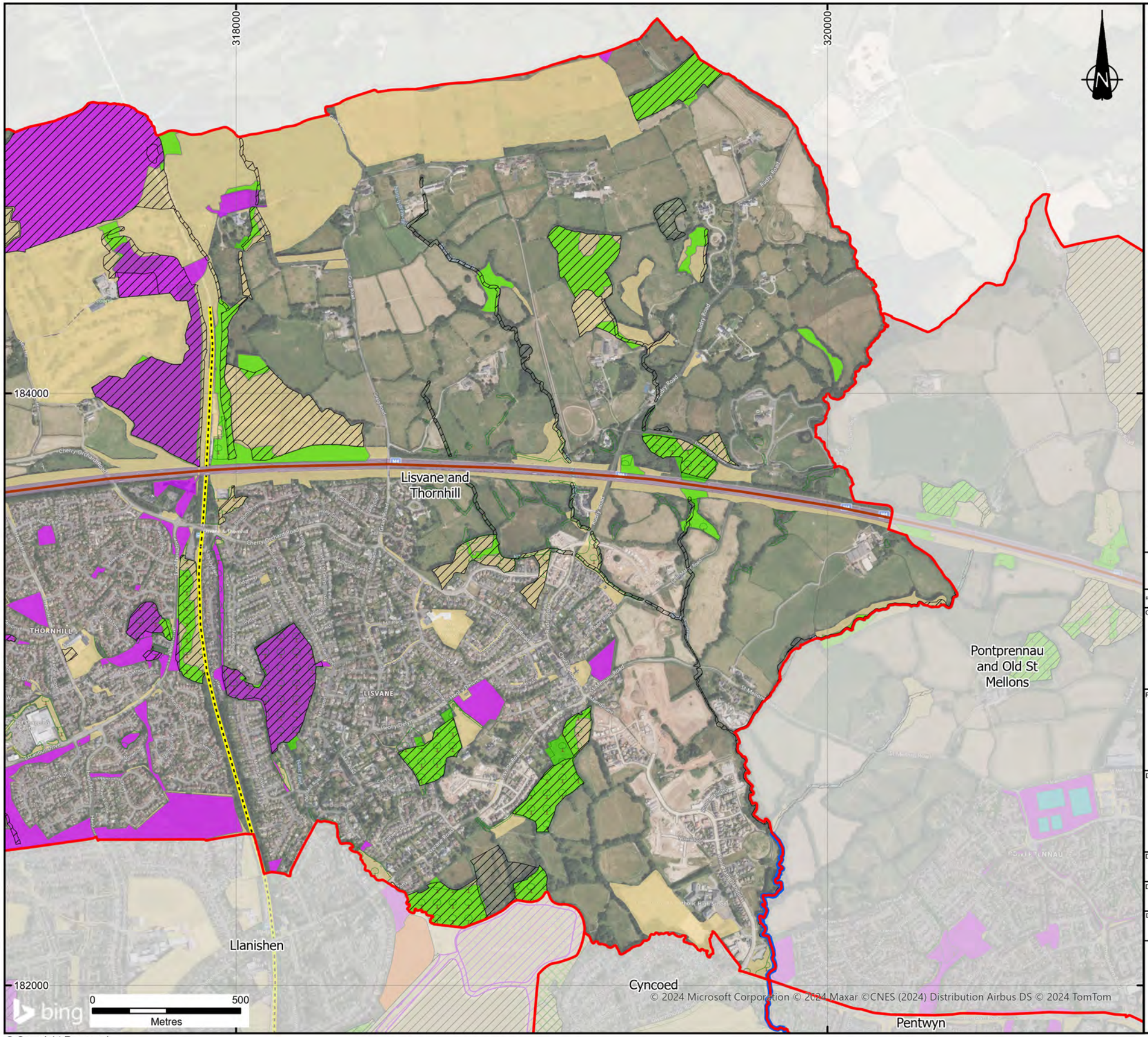

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
- Regionally important geological and geomorphological sites
- Open Space
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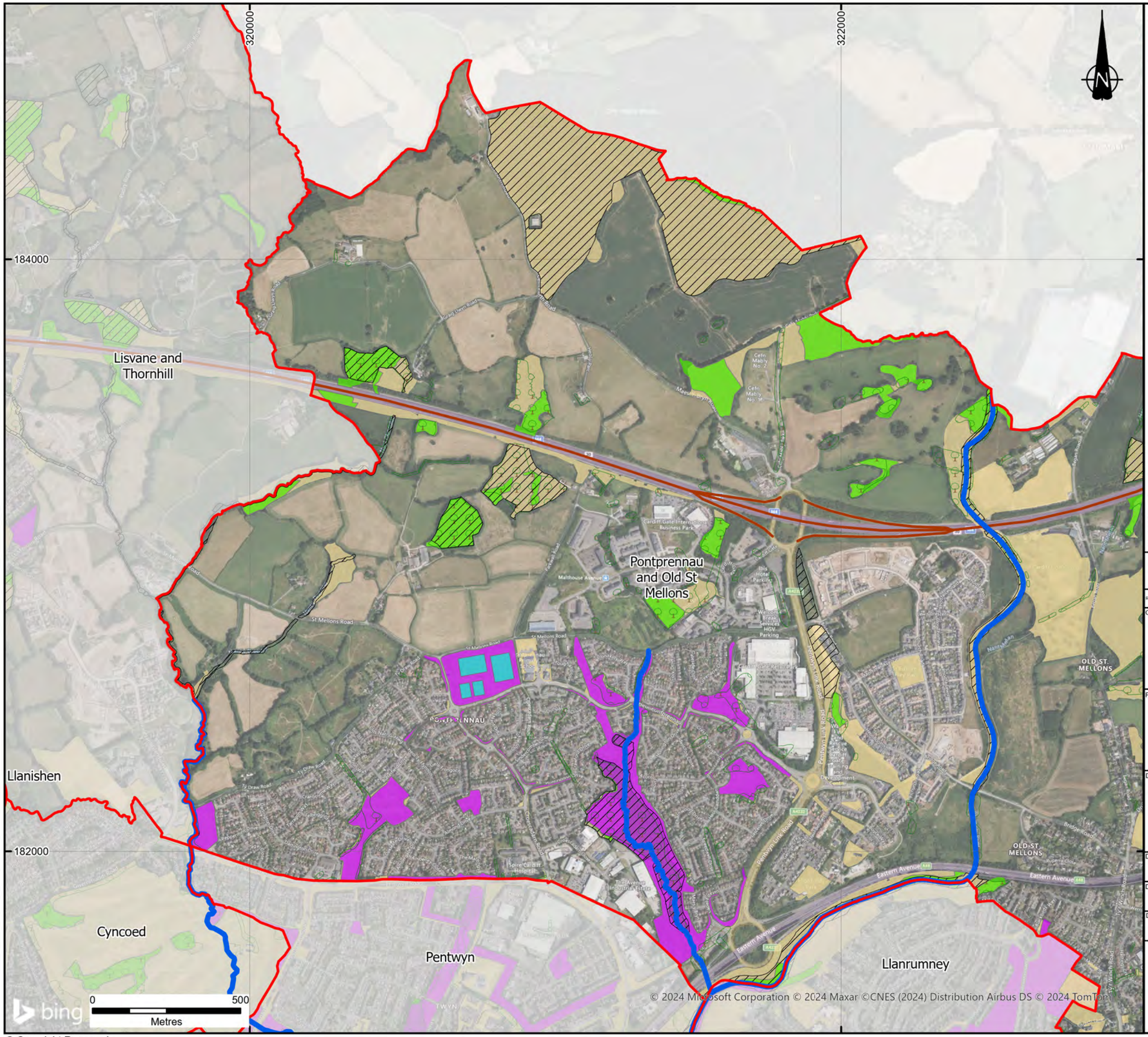

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Allotments
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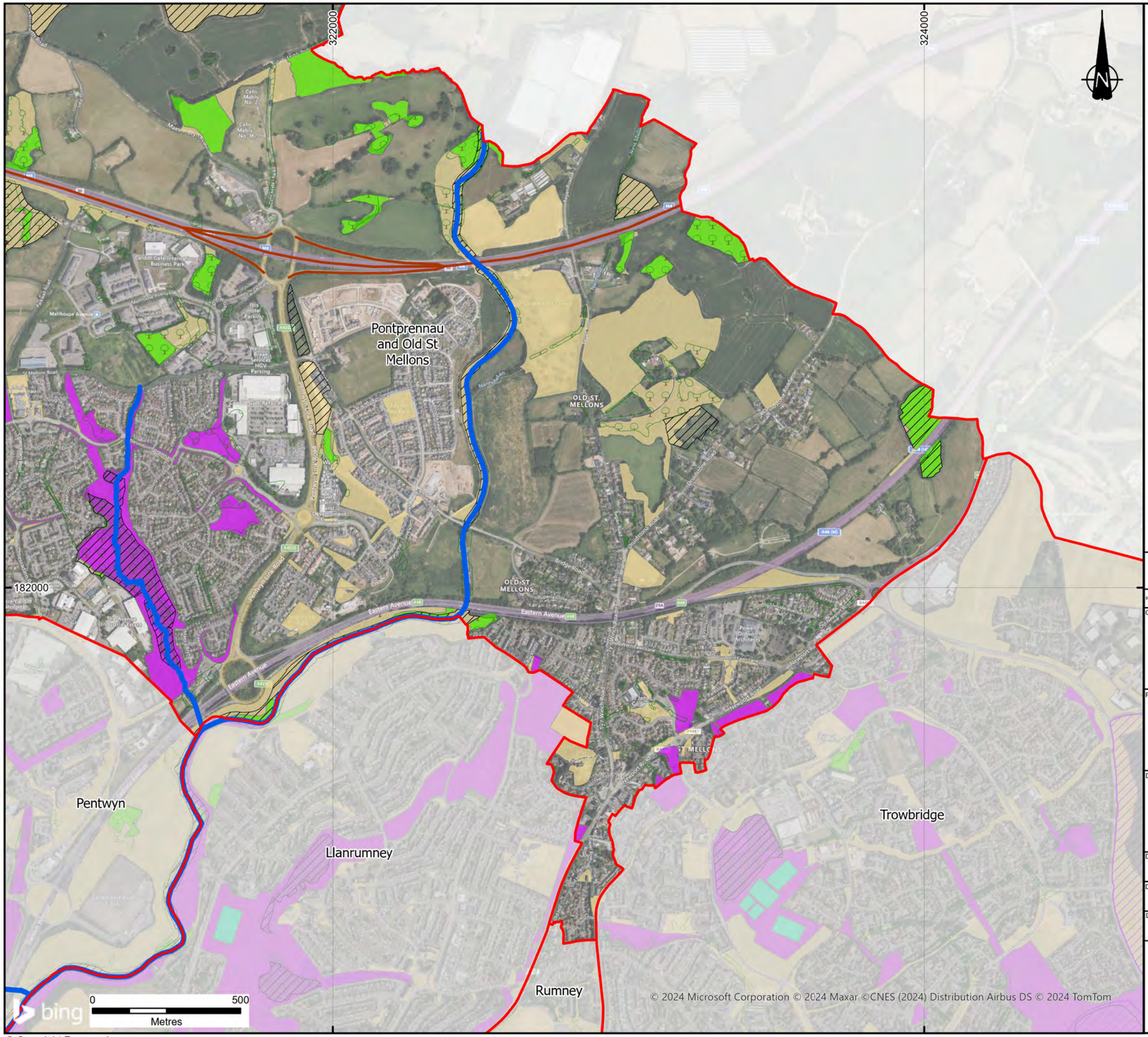

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Allotments
- M4 Corridor
- Main Rivers

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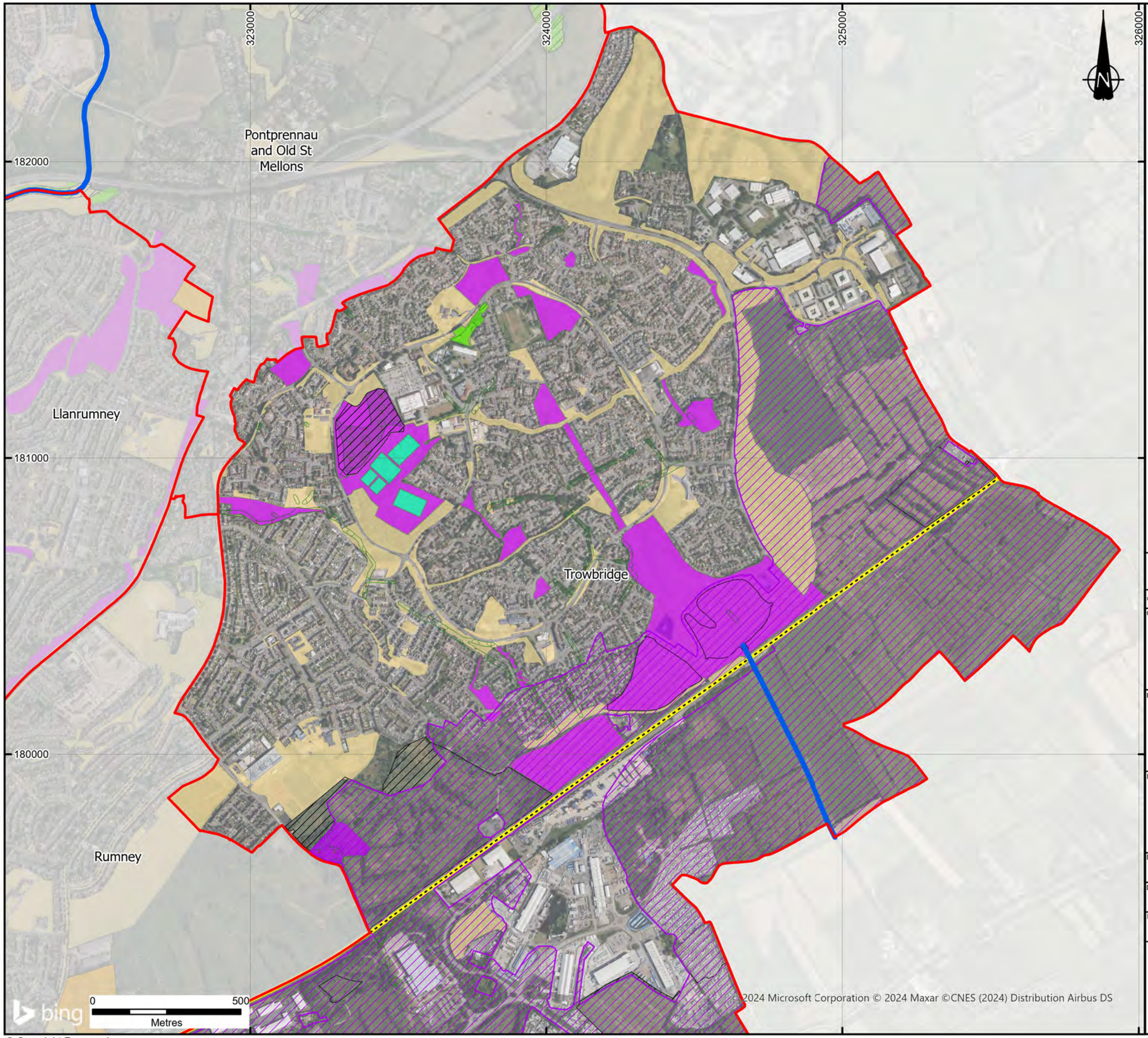

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Ancient Woodland
- Tree Preservation Order
- Sports Pitches
- Parks and Sports
- Open Space
- Main Rivers
- Railway Corridor

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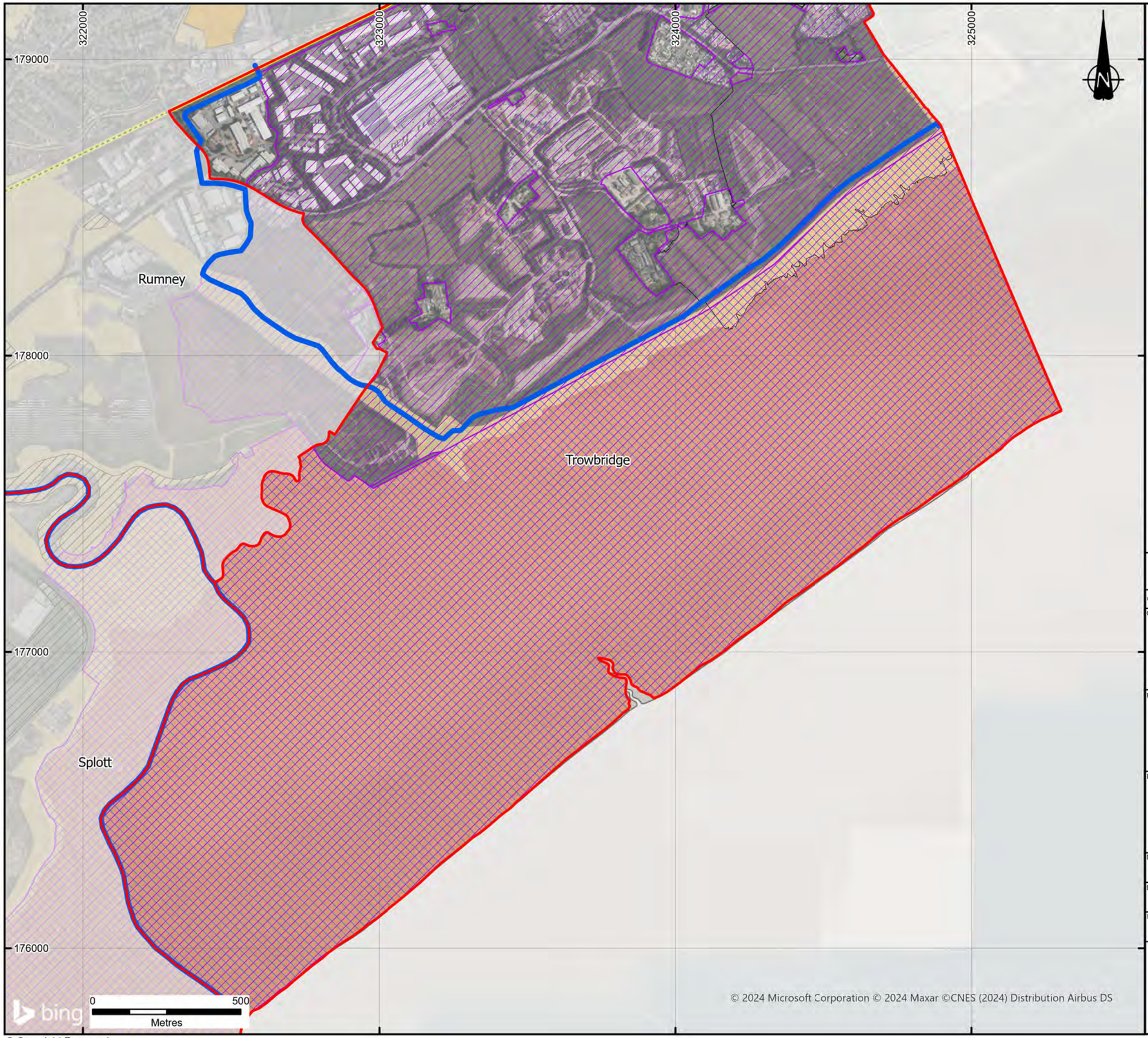

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Special Protection Area
- Special Areas of Conservation
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Open Space
- Main Rivers
- Railway Corridor

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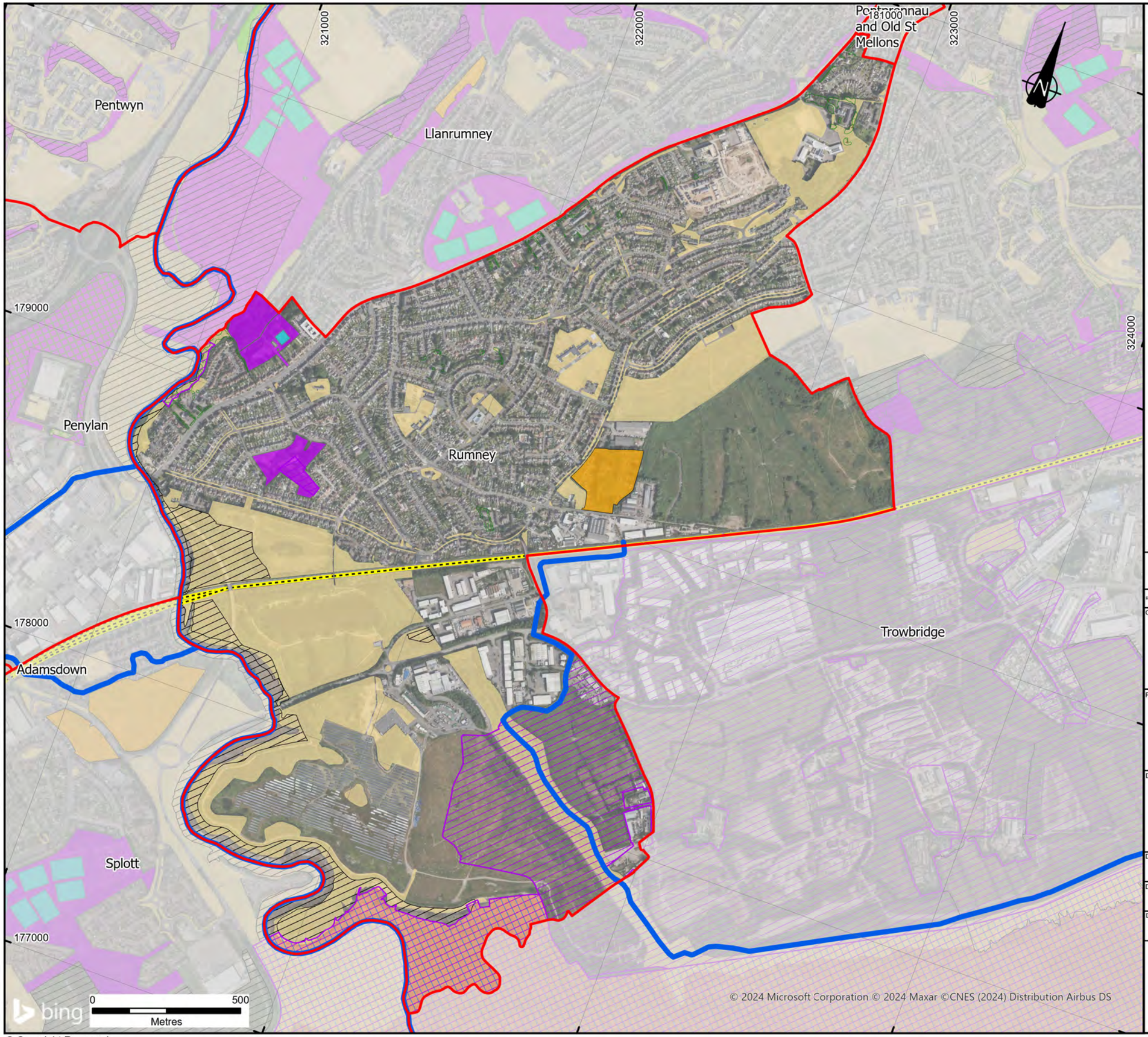

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Special Areas of Conservation
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
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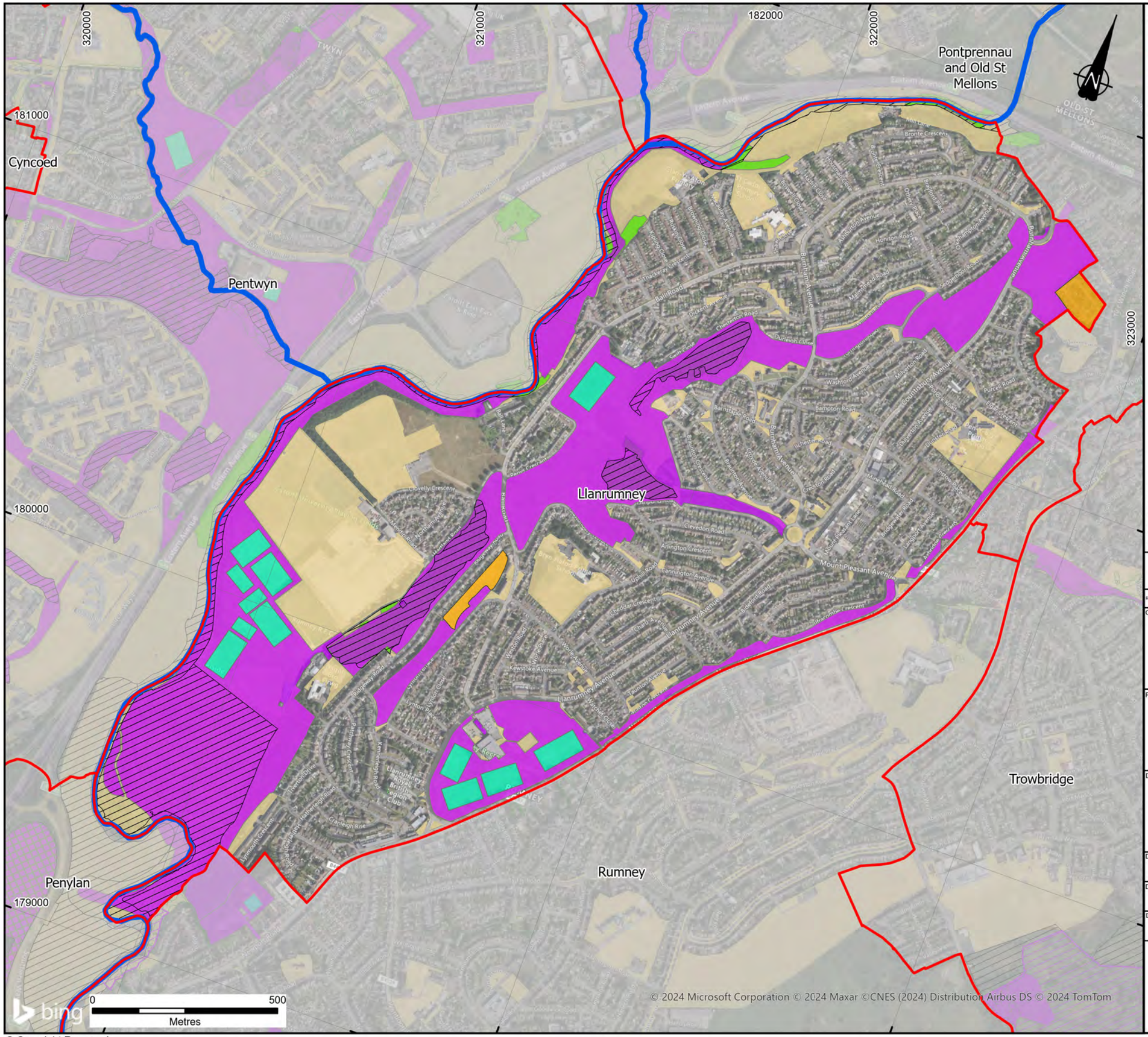

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
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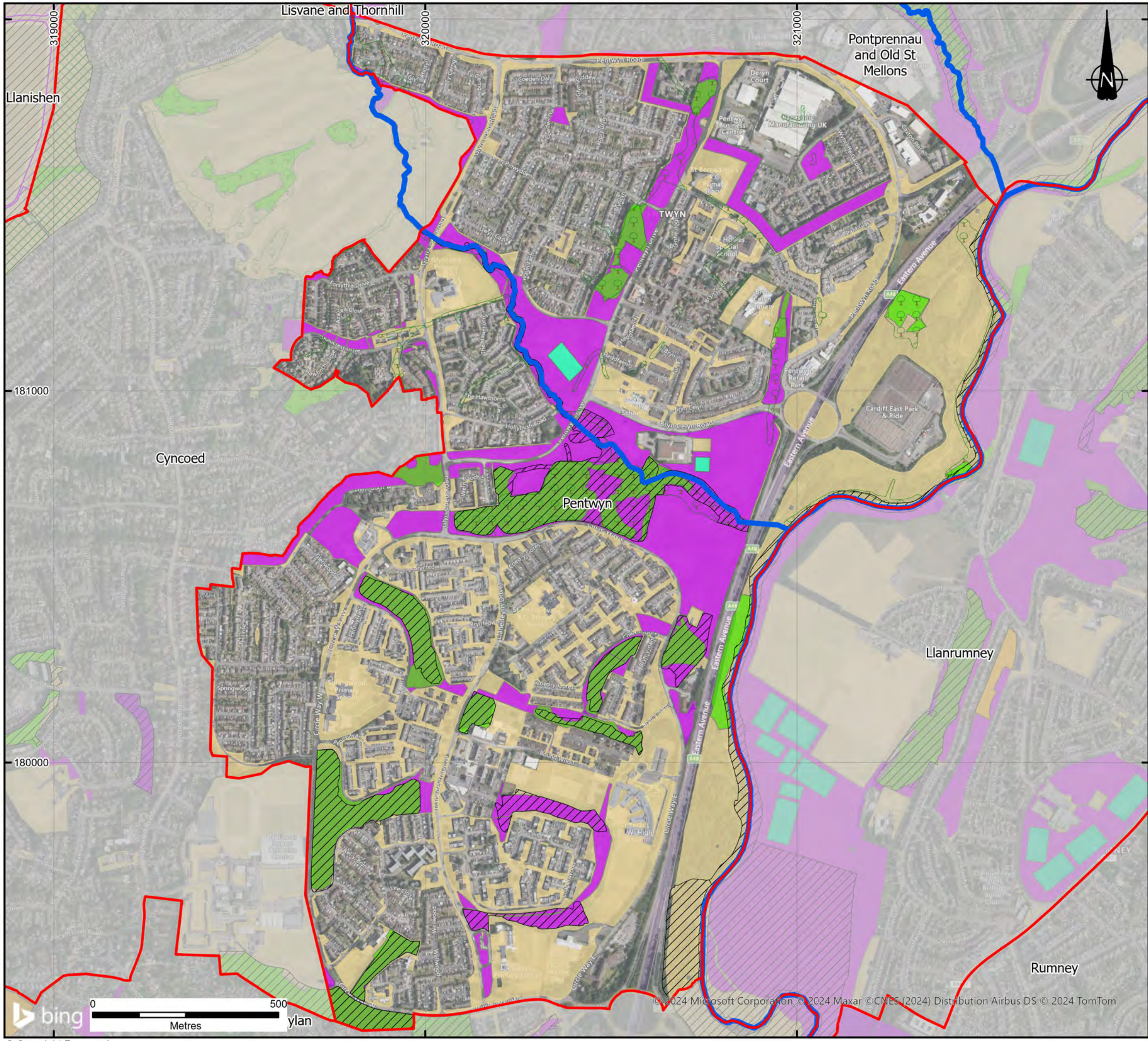

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
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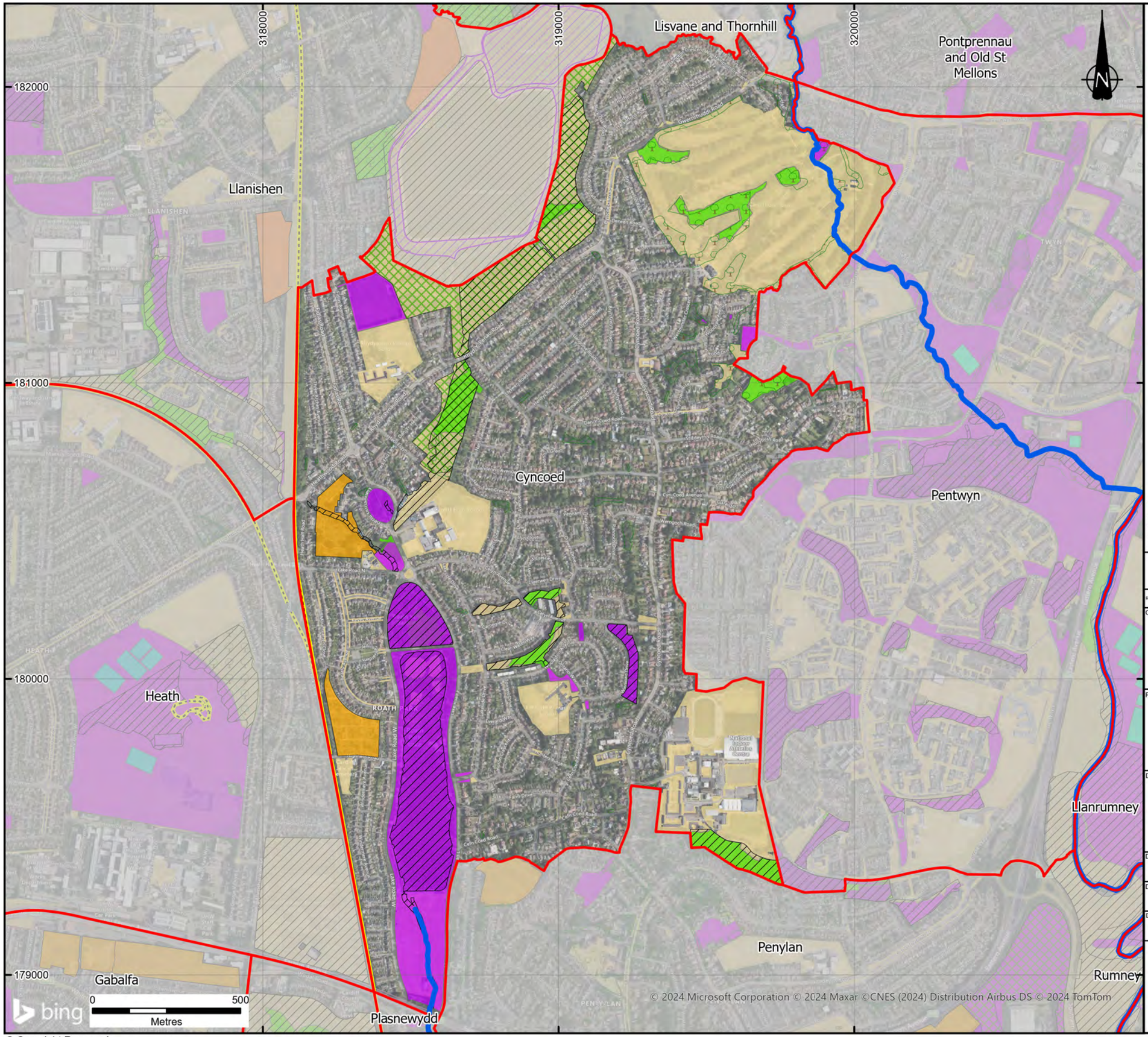

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
- Regionally important geological and geomorphological sites
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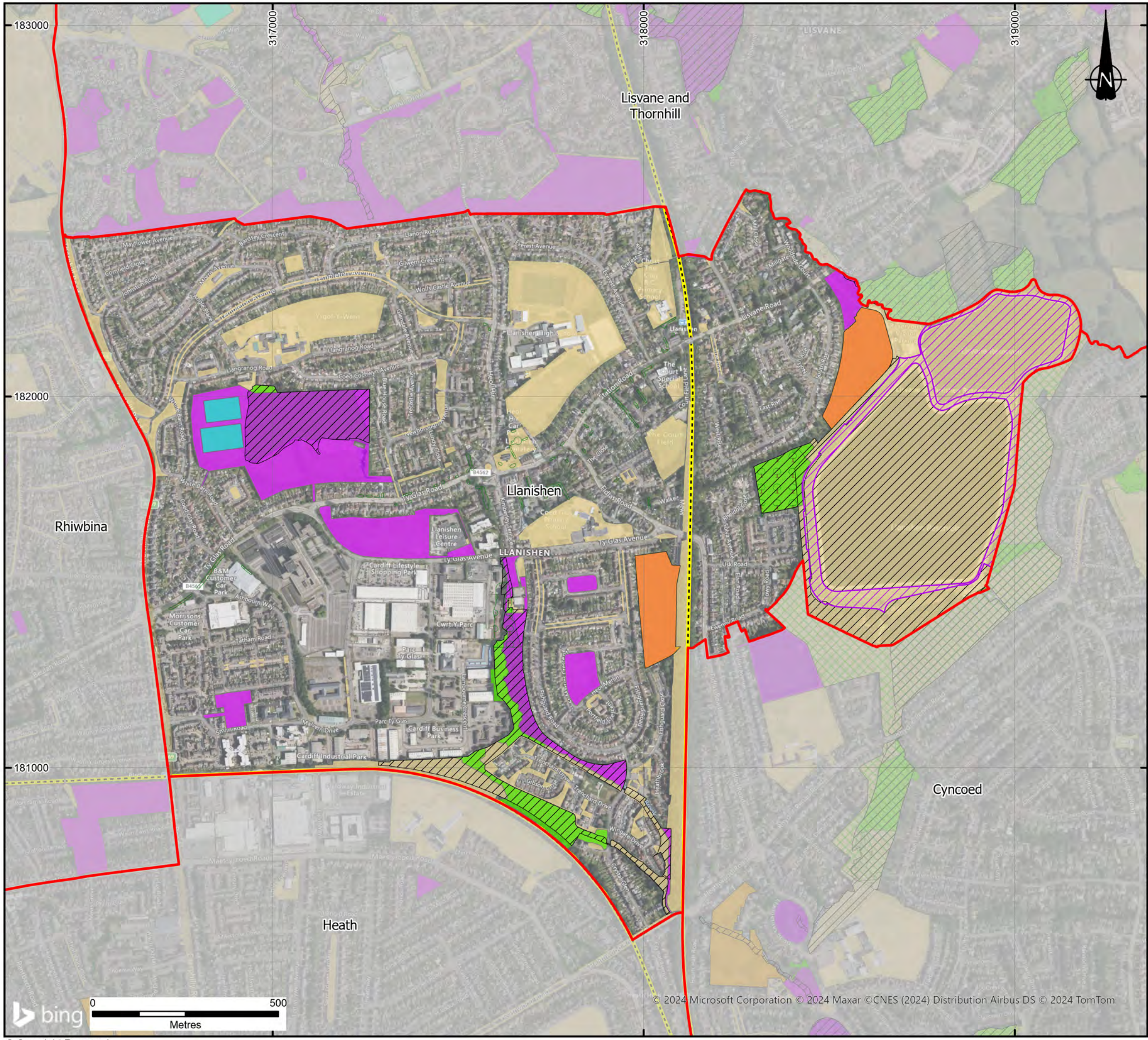

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Site of Importance For Nature Conservation
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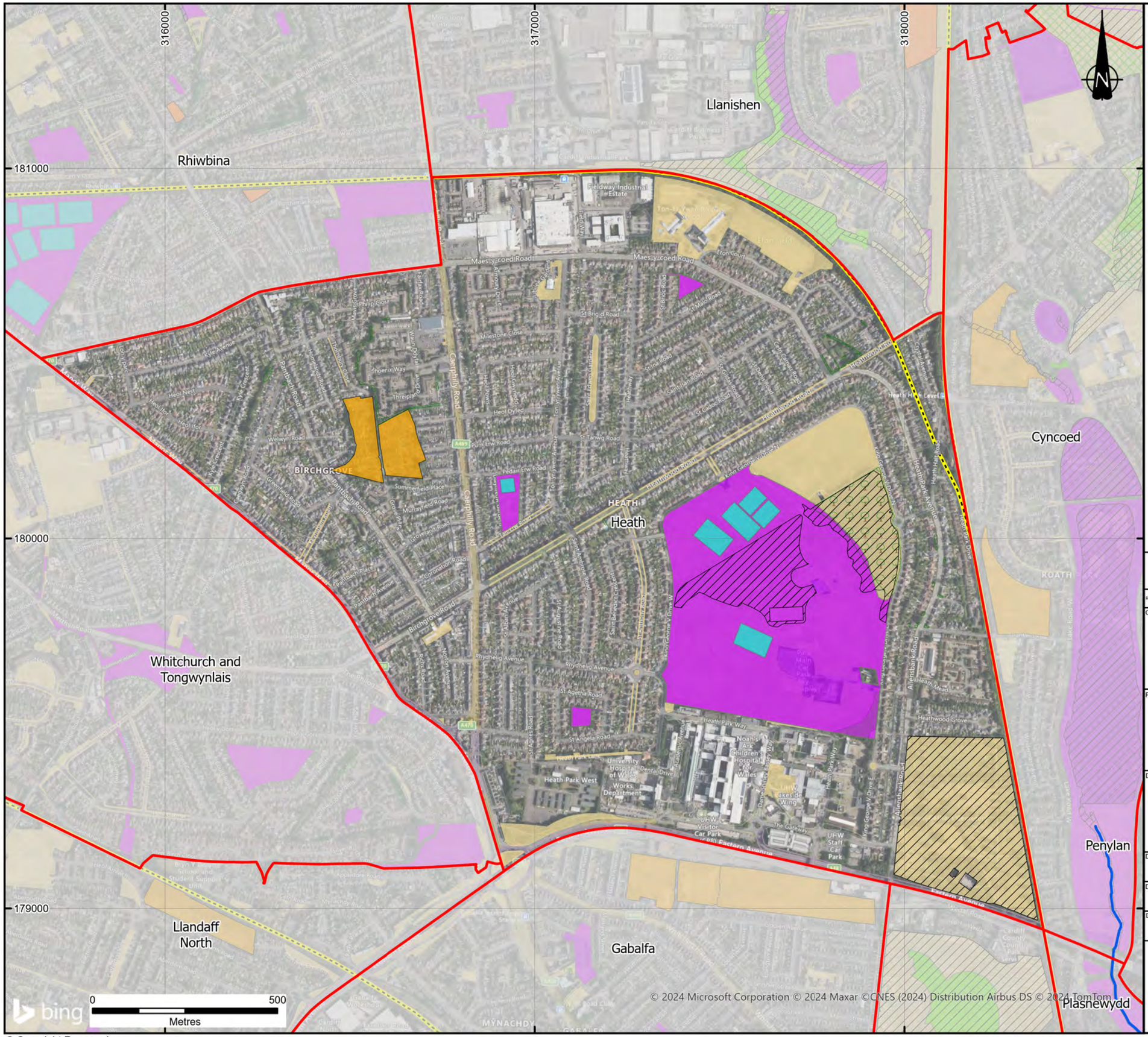

KEY

- Cardiff Ward
- Sites of Special Scientific Interest
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HEATH WARD

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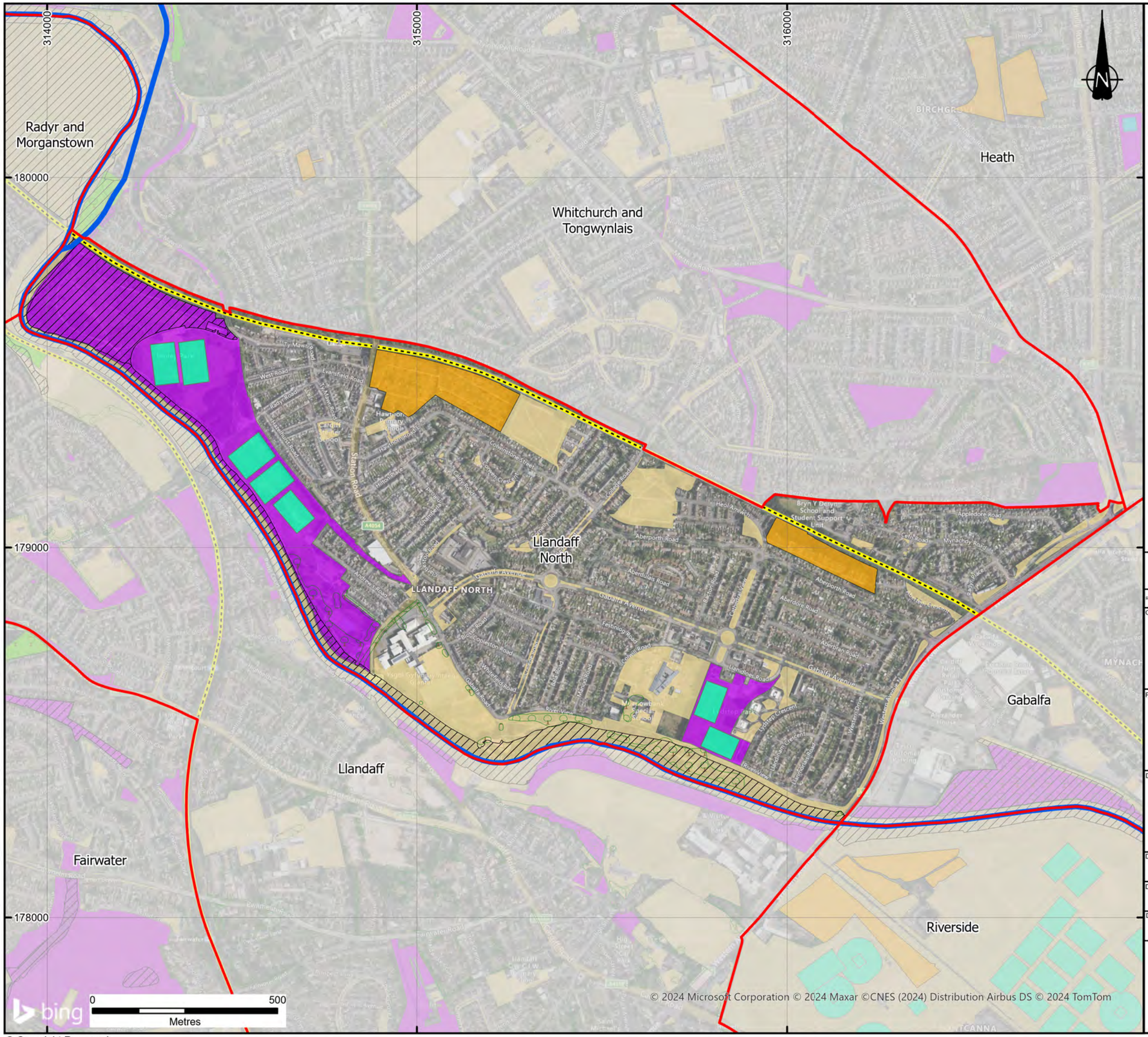

KEY

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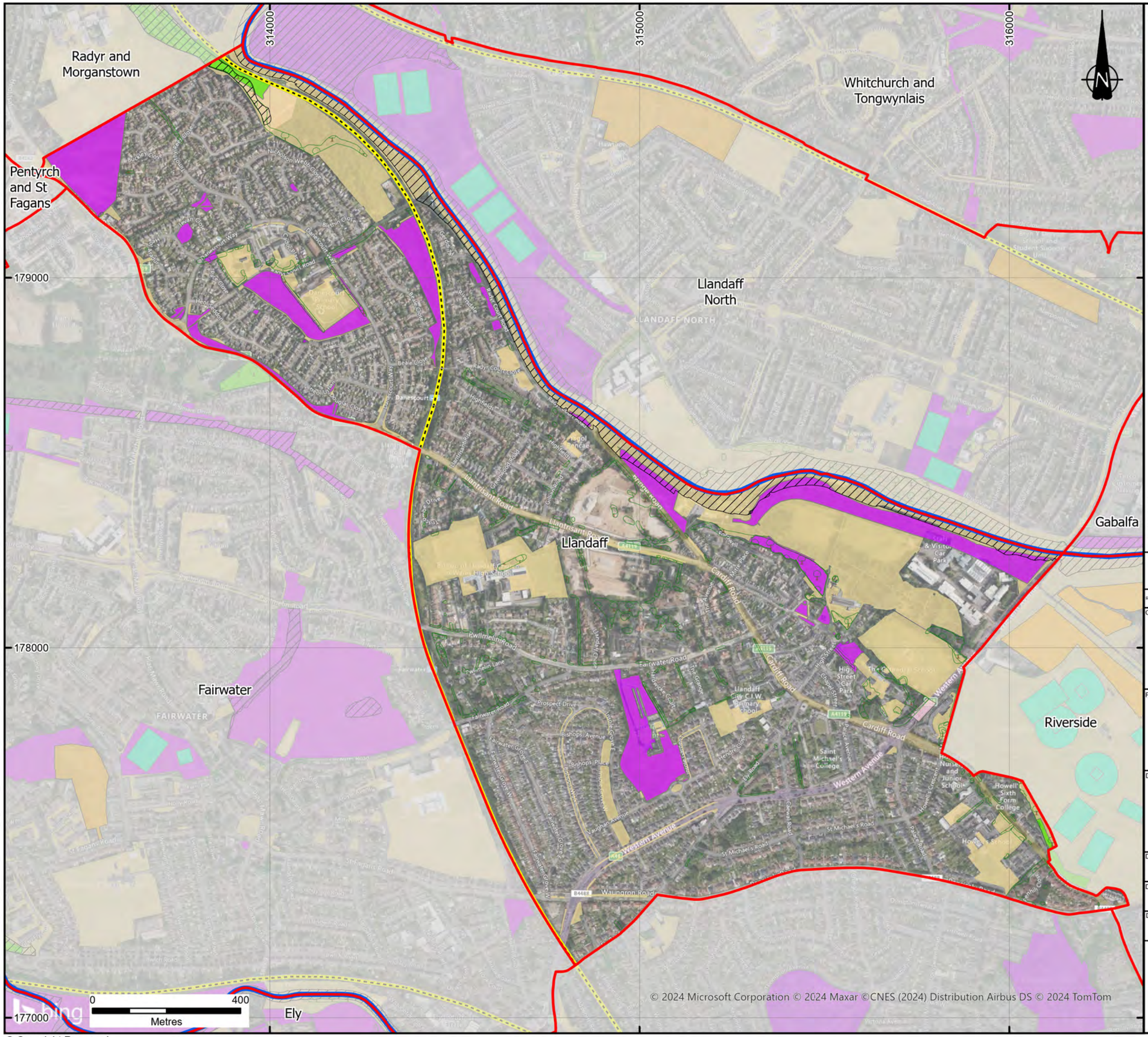

KEY

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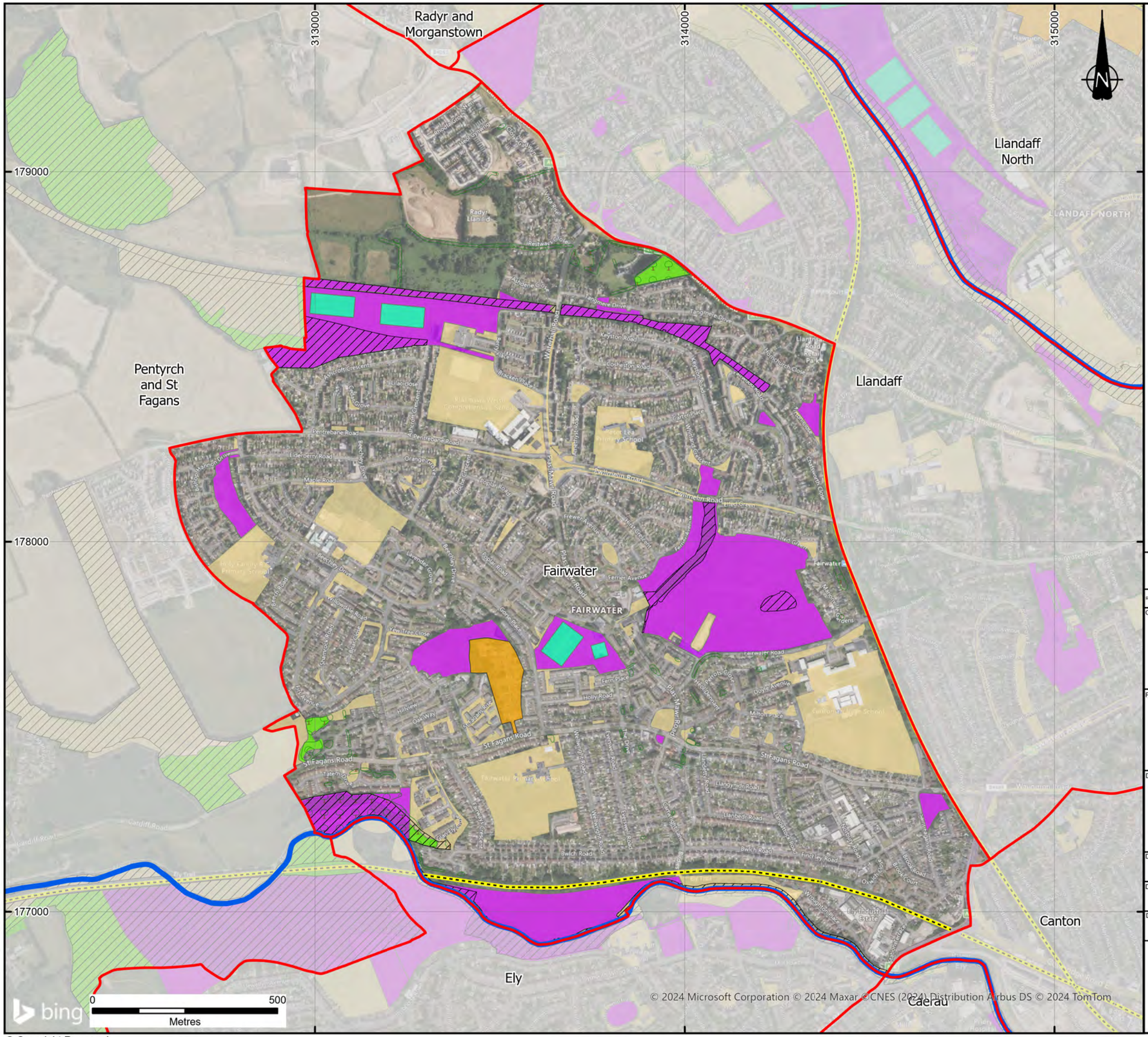

KEY

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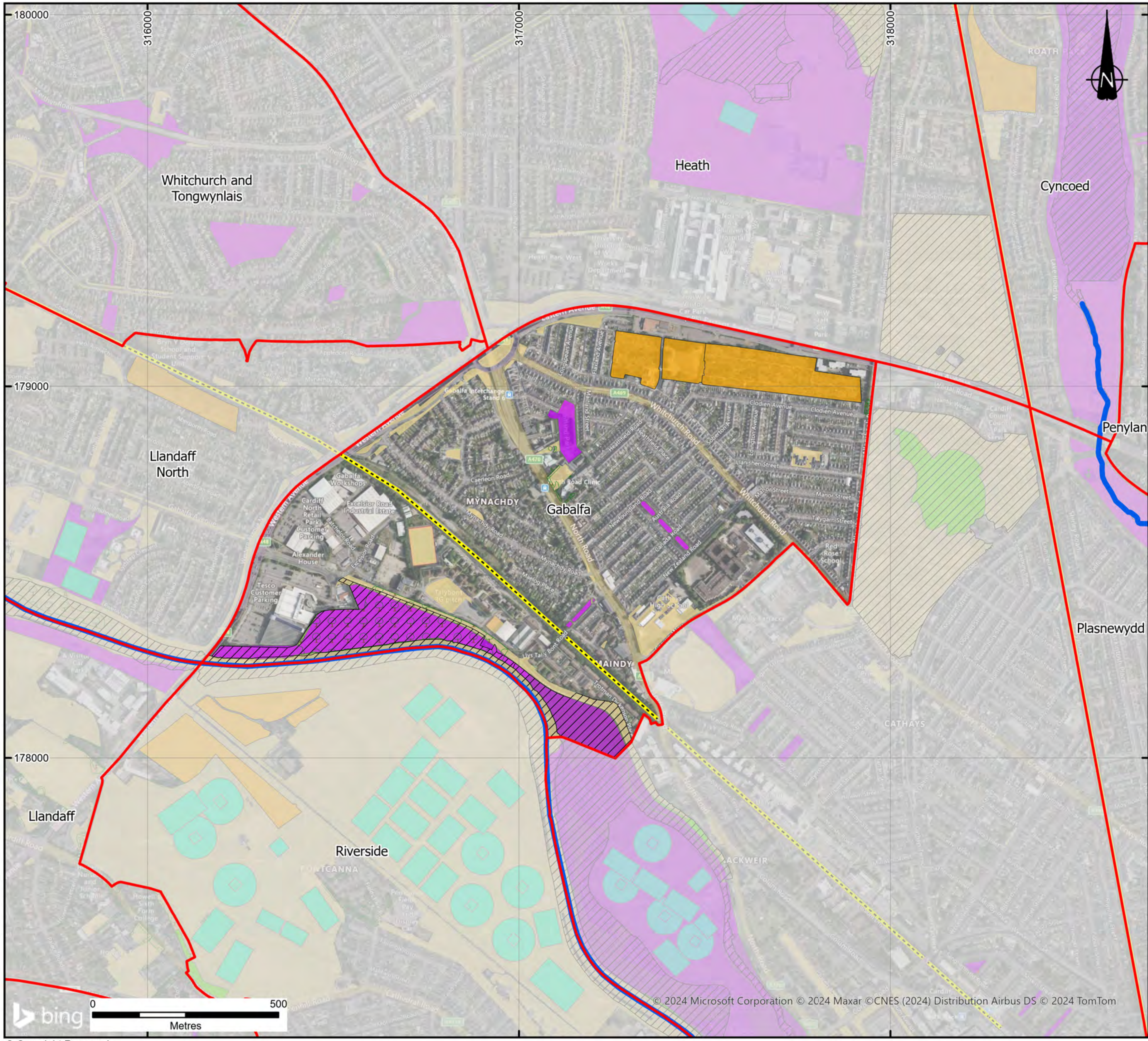

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Regionally important geological and geomorphological sites
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Allotments
- Railway Corridor
- Main Rivers

Notes:

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A	FIRST ISSUE	12/12/24	RCB	AC	JH

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

GABALFA WARD

DRG No.	REV	SUIT. CODE
CA12850-018	A	--

DRG SIZE	SCALE	DATE
A3	1:10,000	12/12/2024

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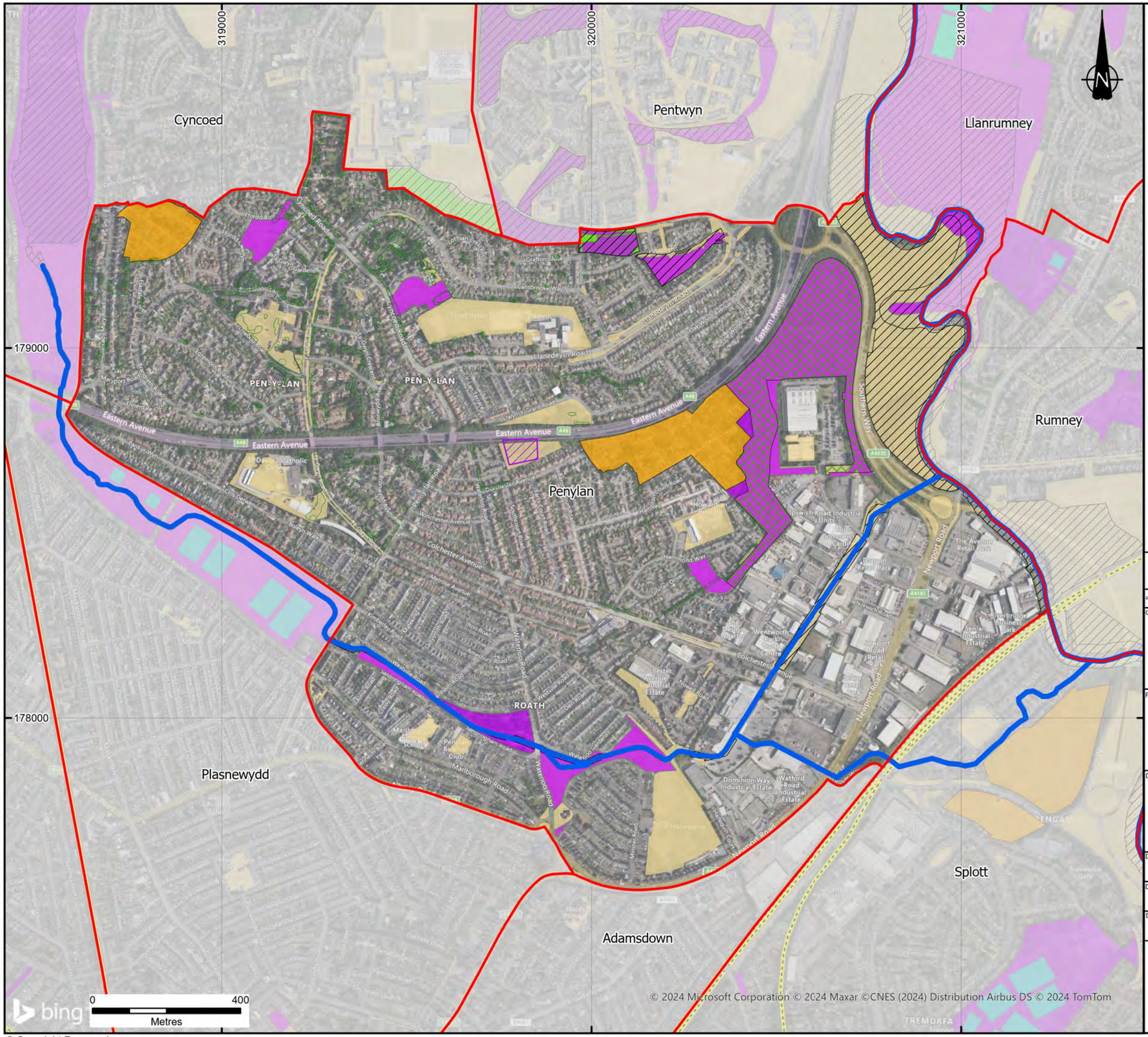

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Local Nature Reserve
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Allotments
- Railway Corridor
- Main Rivers

Notes:

Boundaries are indicative. Aerial imagery shown for context purposes only.

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

PENYLAN WARD

DRG No.	REV	SUIT. CODE
CA12850-019	A	--

DRG SIZE	SCALE	DATE
A3	1:10,000	12/12/2024

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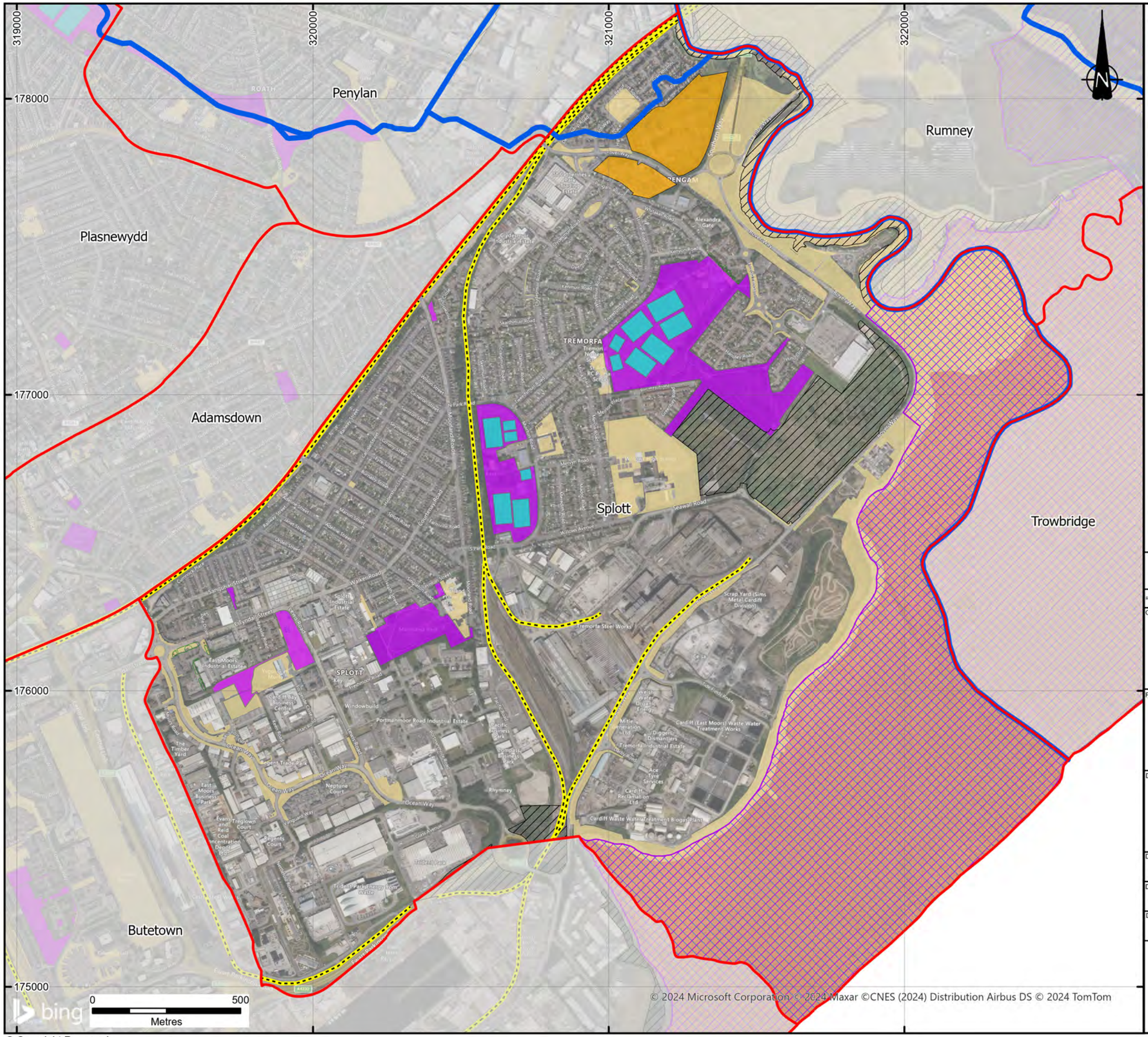

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Special Areas of Conservation
- Sites of Special Scientific Interest
- Special Protection Area
- Open Space
- Parks and Sports
- Sports Pitches
- Allotments
- Tree Preservation Order
- Railway Corridor
- Main Rivers

Notes:

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

SPLOTT WARD

DRG No.	REV	SUIT. CODE
CA12850-020	A	--

DRG SIZE	SCALE	DATE
A3	1:12,500	12/12/2024

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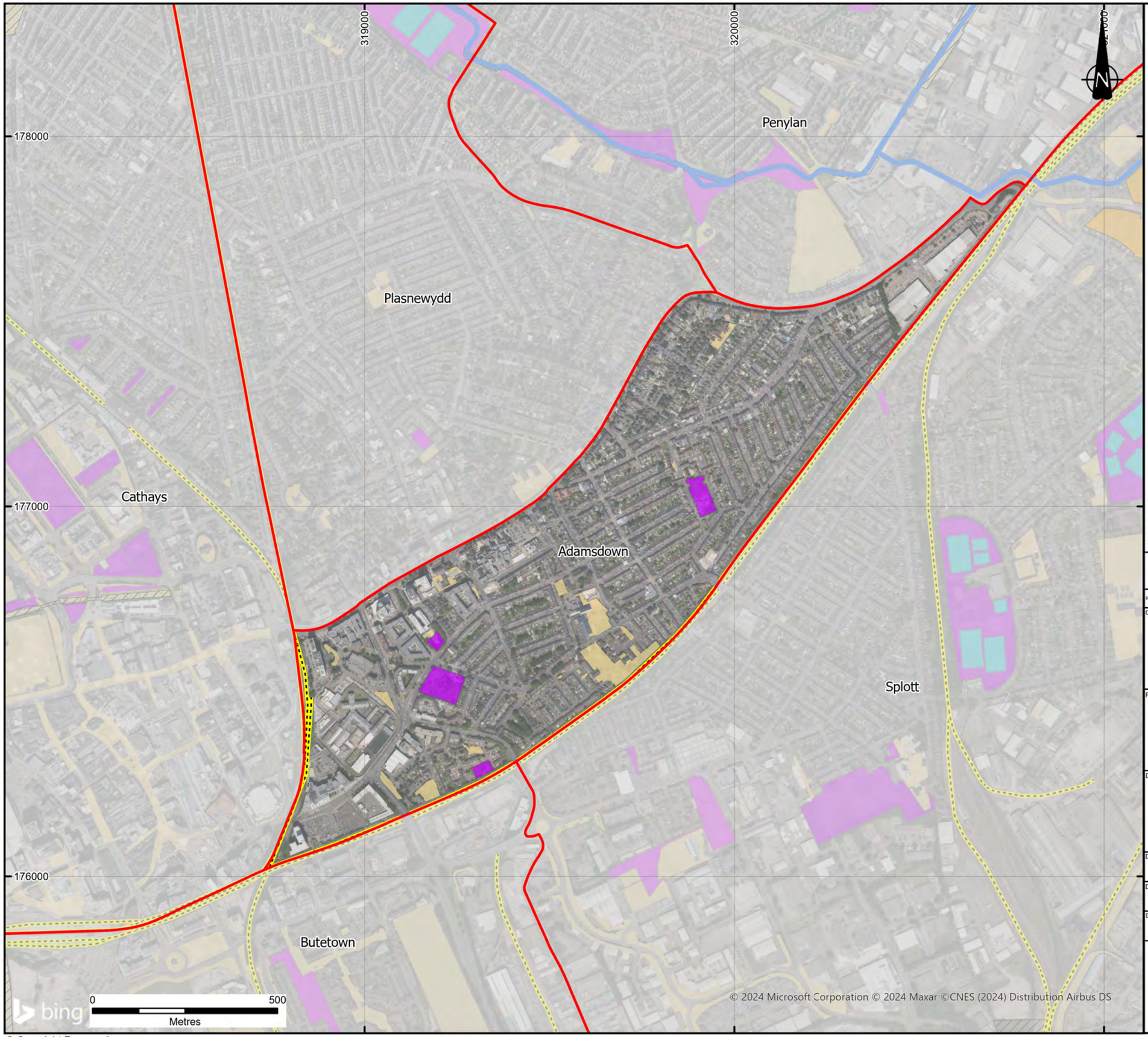

KEY

- Cardiff Wards
- Open Space
- Parks and Sports
- Railway Corridor

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A	FIRST ISSUE	12/12/24	RCB	AC	JH

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PROJECT: STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE: ADAMSDOWN WARD

DRG No.	REV	SUIT. CODE
CA12850-021	A	--

DRG SIZE	SCALE	DATE
A3	1:10,000	12/12/2024

DRAWN BY	CHECKED BY	APPROVED BY
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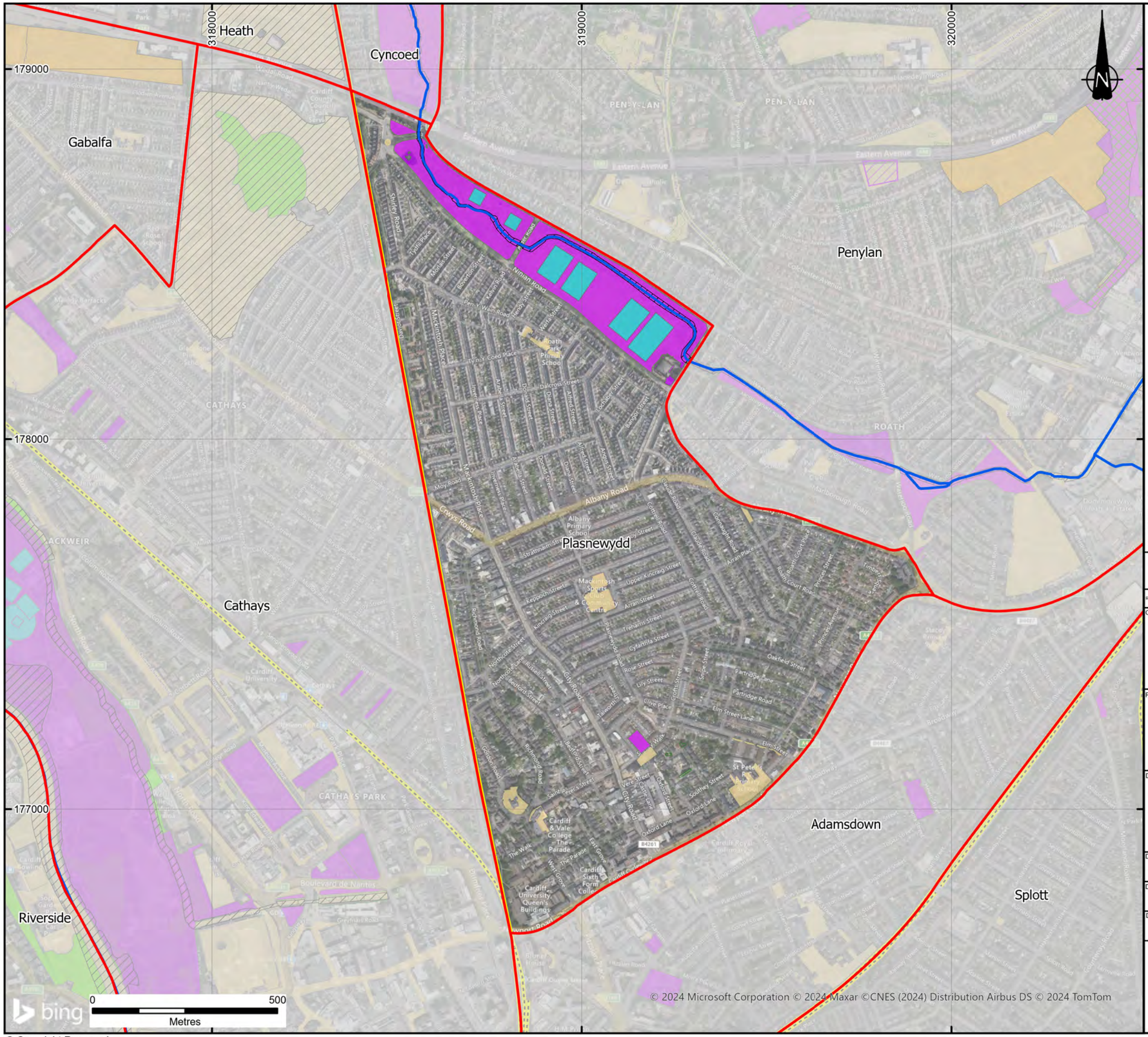

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Open Space
- Parks and Sports
- Sports Pitches
- Railway Corridor
- Main Rivers

Notes:

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

PLASNEWYDD WARD

DRG No.	REV	SUIT. CODE
CA12850-022	A	--

DRG SIZE	SCALE	DATE
A3	1:10,000	12/12/2024

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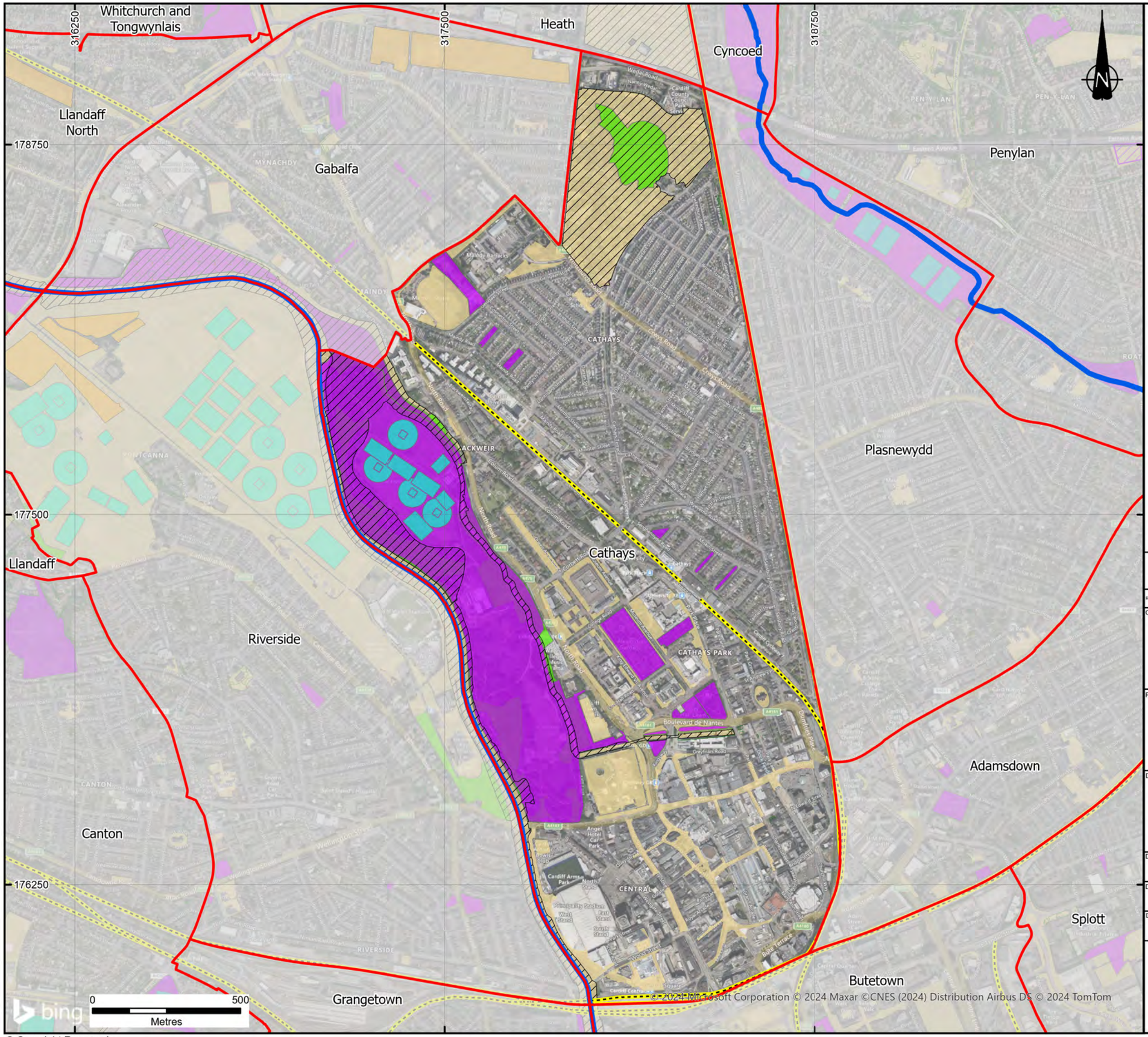

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Railway Corridor
- Main Rivers

Notes:

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

CATHAYS WARD

DRG No.	REV	SUIT. CODE
CA12850-023	A	--

DRG SIZE	SCALE	DATE
A3	1:12,500	12/12/2024

DRAWN BY	CHECKED BY	APPROVED BY
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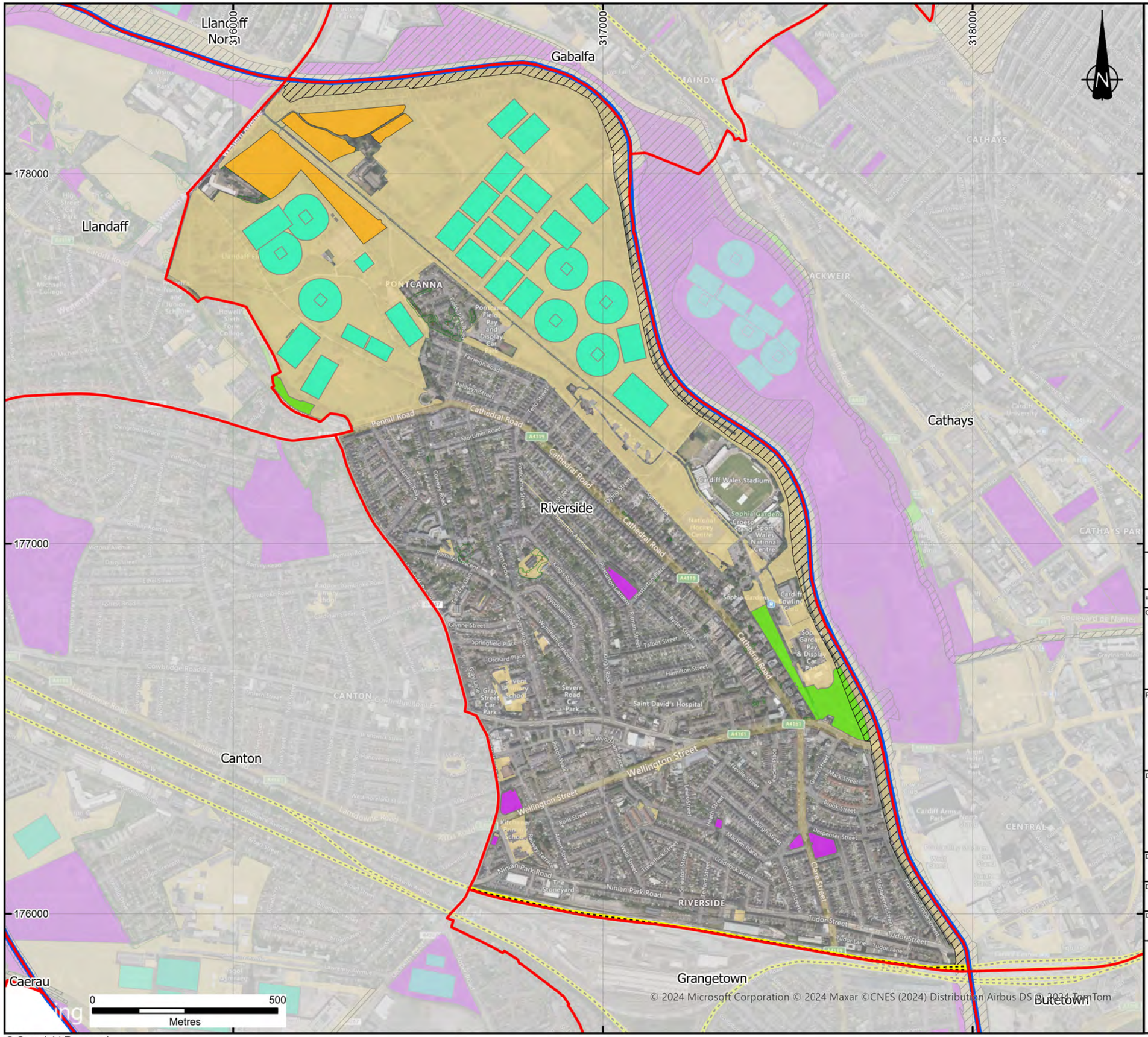

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Allotments
- Railway Corridor
- Main Rivers

Notes:

Boundaries are indicative Aerial imagery shown for context purposes only.

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A	FIRST ISSUE	12/12/24	RCB	AC	JH

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

RIVERSIDE WARD

DRG No.	REV	SUIT. CODE
CA12850-024	A	--

DRG SIZE	SCALE	DATE
A3	1:10,000	12/12/2024

DRAWN BY	CHECKED BY	APPROVED BY
RCB	AC	JH

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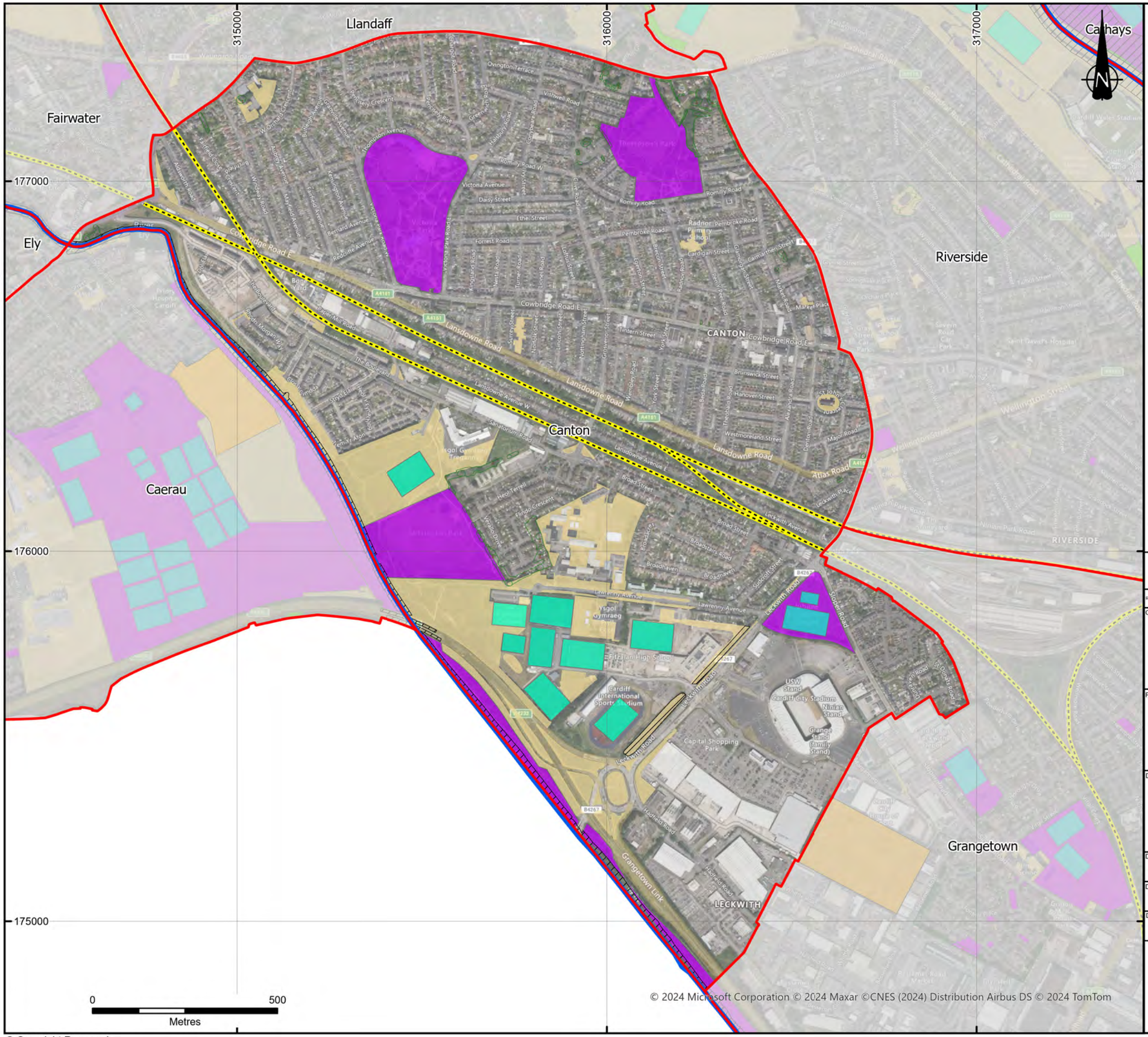

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Open Space
- Parks and Sports
- Sports Pitches
- Railway Corridor
- Main Rivers

Notes:

Boundaries are indicative. Aerial imagery shown for context purposes only.

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DRAWING TITLE

CANTON WARD

DRG No.	REV	SUIT. CODE
CA12850-025	A	--

DRG SIZE	SCALE	DATE
A3	1:10,000	12/12/2024

DRAWN BY	CHECKED BY	APPROVED BY
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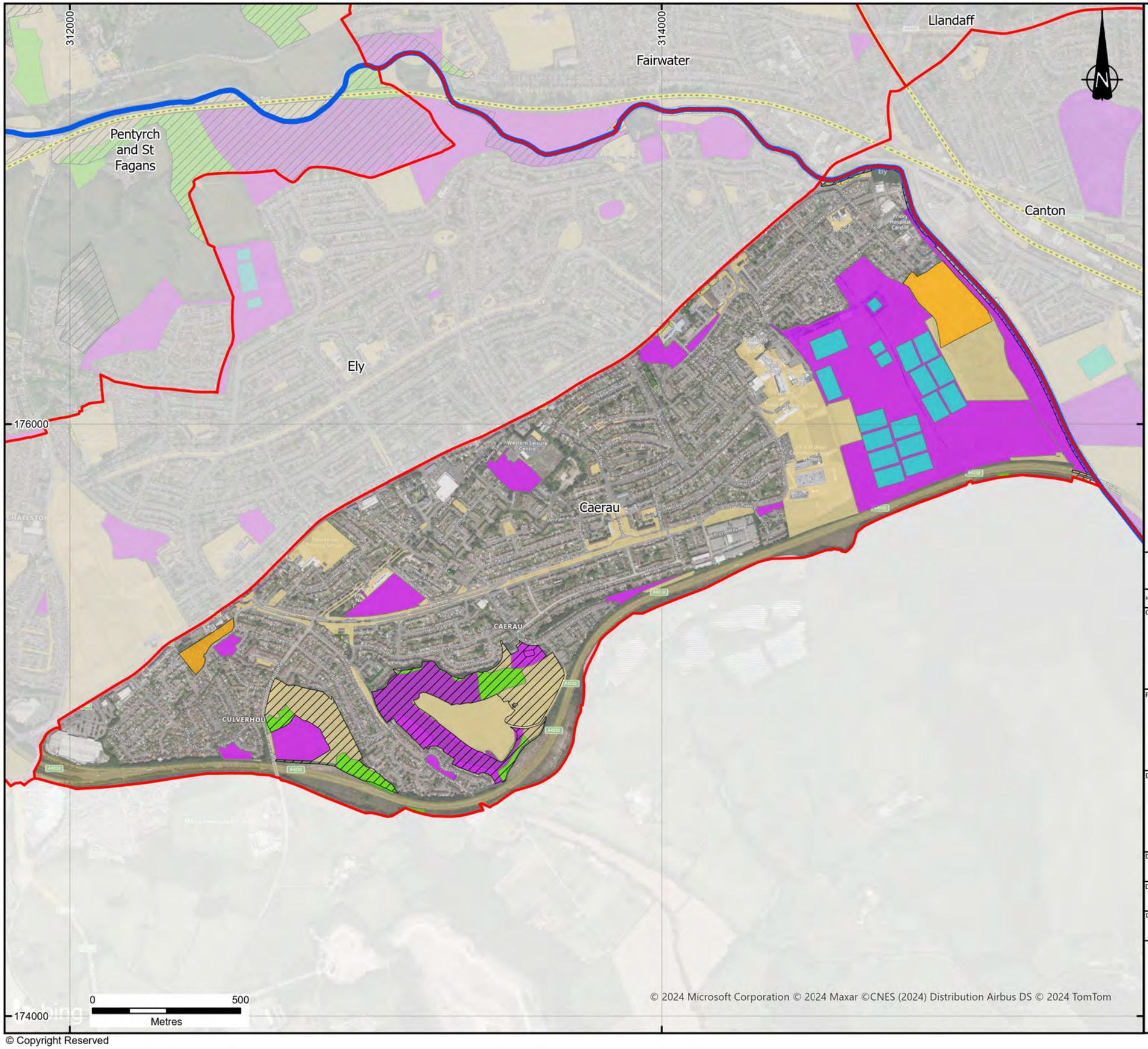

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Allotments
- Railway Corridor
- Main Rivers

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DRAWING TITLE

CAERAU WARD

DRG No.	REV	SUIT. CODE
CA12850-026	A	--

DRG SIZE	SCALE	DATE
A3	1:12,500	12/12/2024

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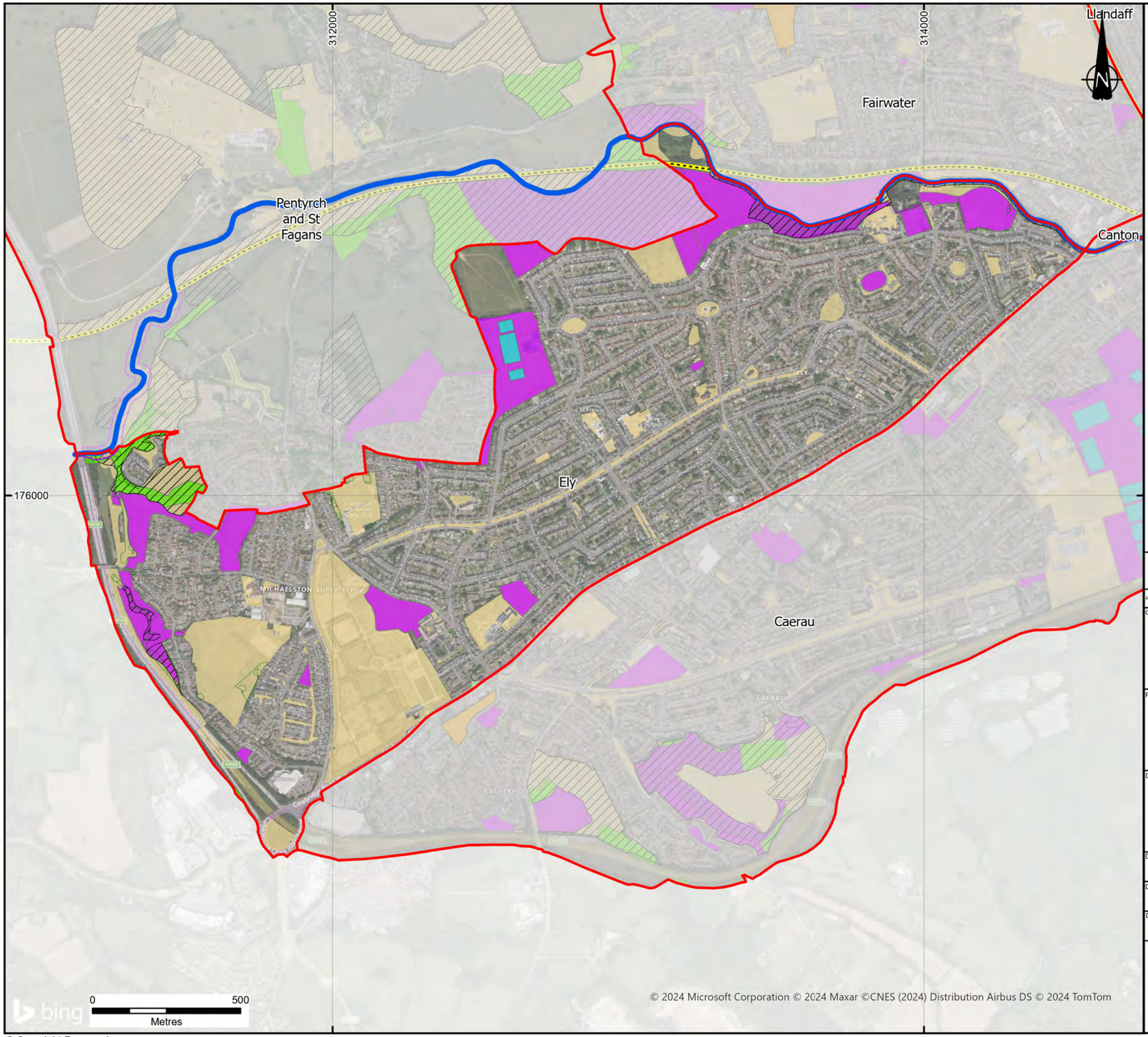

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Sites of Special Scientific Interest
- Tree Preservation Order
- Open Space
- Ancient Woodland
- Parks and Sports
- Sports Pitches
- Railway Corridor
- Main Rivers

Notes:
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DRAWING TITLE

ELY WARD

DRG No.	REV	SUIT. CODE
CA12850-027	A	--

DRG SIZE	SCALE	DATE
A3	1:12,500	12/12/2024

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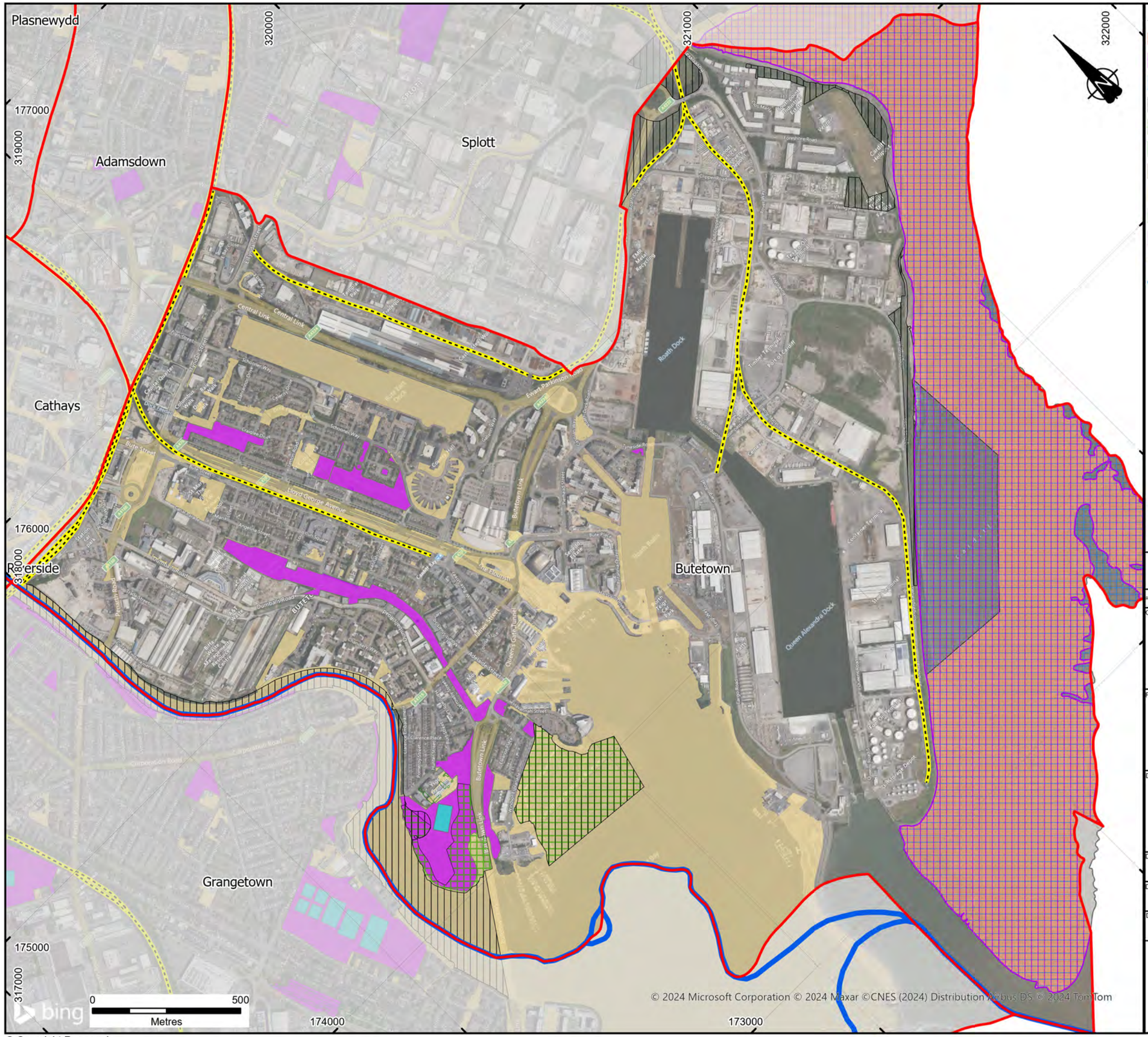

KEY

- Cardiff Wards
- Sites of Special Scientific Interest
- Special Areas of Conservation
- Site of Importance For Nature Conservation
- Local Nature Reserve
- Tree Preservation Order
- Special Protection Area
- Open Space
- Parks and Sports
- Sports Pitches
- Railway Corridor
- Main Rivers

Notes:
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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

BUTETOWN WARD

DRG No.	REV	SUIT. CODE
CA12850-028	A	--

DRG SIZE	SCALE	DATE
A3	1:12,500	12/12/2024

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RCB	AC	JH

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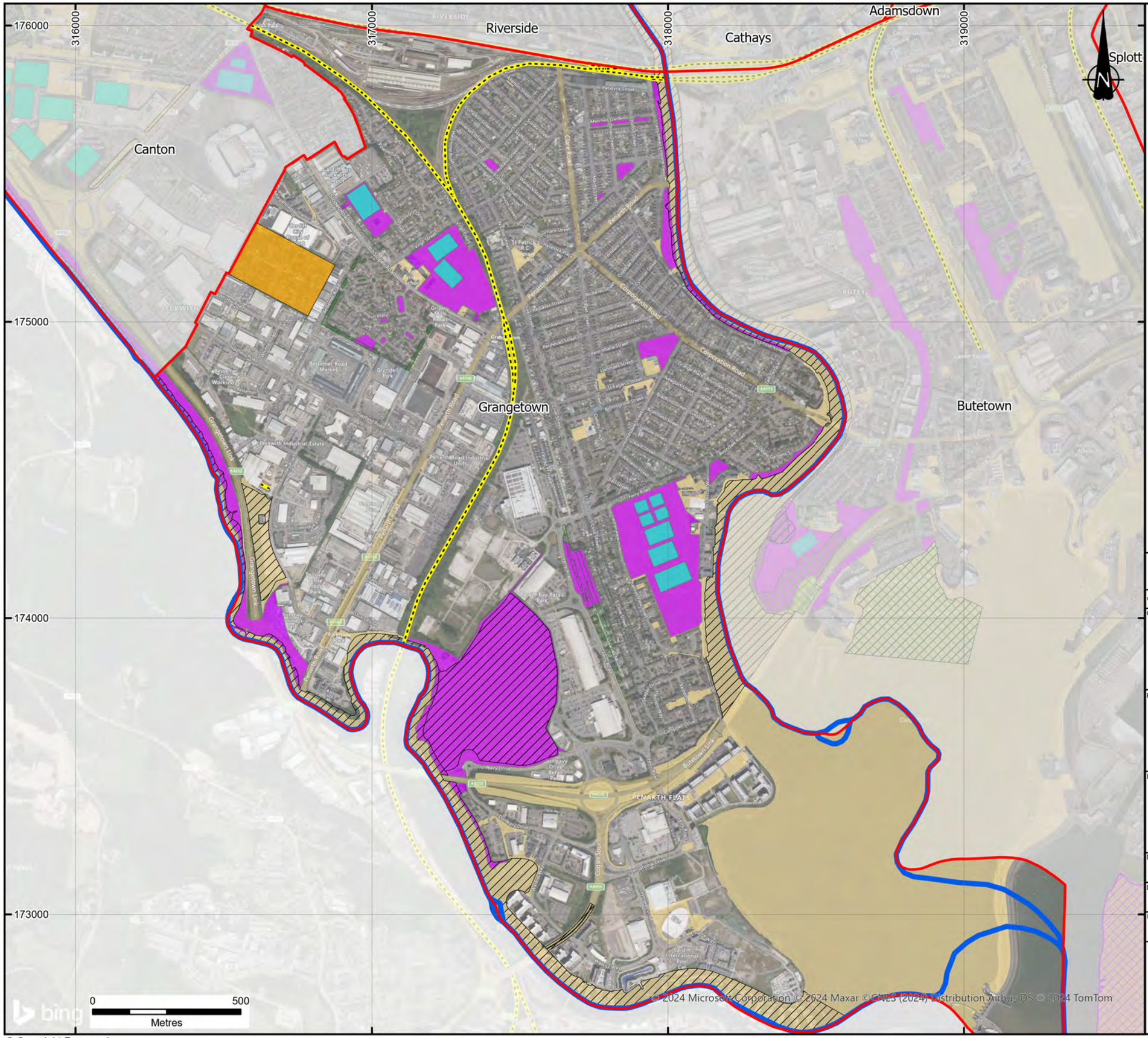

KEY

- Cardiff Wards
- Site of Importance For Nature Conservation
- Tree Preservation Order
- Sports Pitches
- Allotments
- Parks and Sports
- Open Space
- Main Rivers
- Railway Corridor

Notes:
Boundaries are indicative. Aerial imagery shown for context purposes only.

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

GRANGETOWN WARD

DRG No.	REV	SUIT. CODE
CA12850-029	A	--

DRG SIZE	SCALE	DATE
A3	1:12,500	12/12/2024

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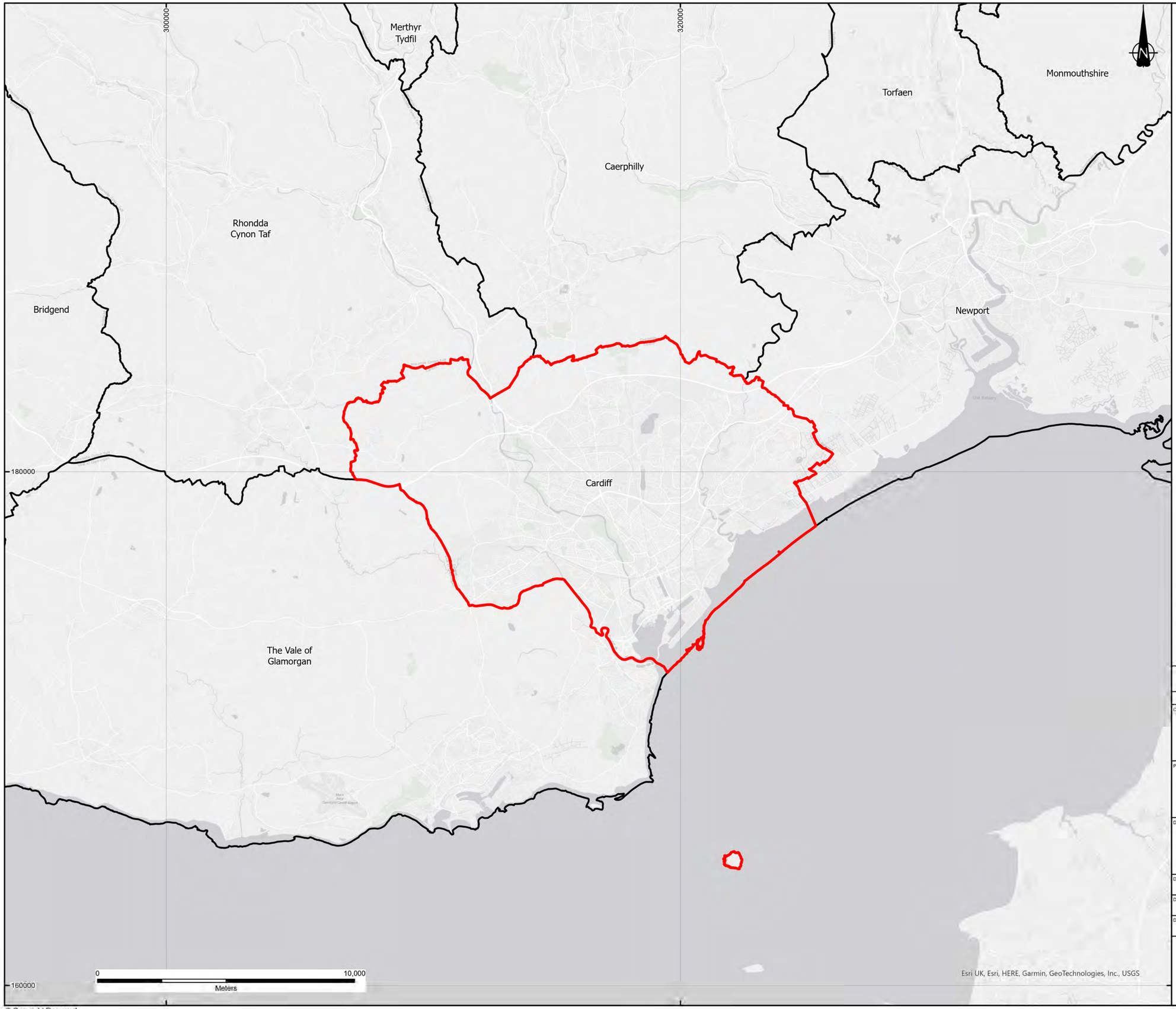
DRAWINGS



KEY

- Cardiff City Boundary
- Adjacent Local Authority Boundaries

Notes:

Boundaries are indicative.

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(REVISION)	DESCRIPTION	DATE	(DRAWN)	(CHK'D)	(APP'D)

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PROJECT

CARDIFF STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

REGIONAL CONTEXT PLAN

DRG No: CA12850-067		REV: A	SUIT. CODE: --
DRG SIZE: A2	SCALE: 1:100,000	DATE: 12/12/2024	
DRAWN BY: RCB	CHECKED BY: AC	APPROVED BY: JH	

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KEY

- Cardiff City Boundary
- Farmland, Woodlands & Rural Settlements GI Zones
- Urban GI Zones
- Coastal GI Zones
- River GI Corridors

Key Landscape Area	Subsections
A. Farmlands, Woodlands & Rural Settlement GI Zone	A1 – Western Cardiff
	A2 – Northern Cardiff
B. Urban GI Zones	B1 – Outer Cardiff (West)
	B2 - Cardiff Centre
	B3 – North-west Cardiff
	B4 – Outer Cardiff (North)
	B5 – North Cardiff
	B6 – North-east Cardiff
	B7 – Outer Cardiff (East)
C. River GI Corridor	C1 - Ely
	C2 - Taff
	C3 - Rhymney
	C4 – Other watercourses
D. Coastal GI Zones	D1 - Gwent Levels- Wentloog
	D2 – Industrial / Dock Areas
	D3 – Cardiff Bay

Notes:

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D
A	FIRST ISSUE	12/12/24	RCB	AC	JH

CLIENT: CARDIFF COUNCIL

PROJECT: STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE: STRATEGIC GREEN INFRASTRUCTURE OPPORTUNITY AREAS/ZONES

DRG No: CA12850-066		REV: A	SUIT. CODE: --
DRG SIZE: A2	SCALE: 1:50,000	DATE: 12/12/2024	
DRAWN BY: RCB	CHECKED BY: AC	APPROVED BY: JH	

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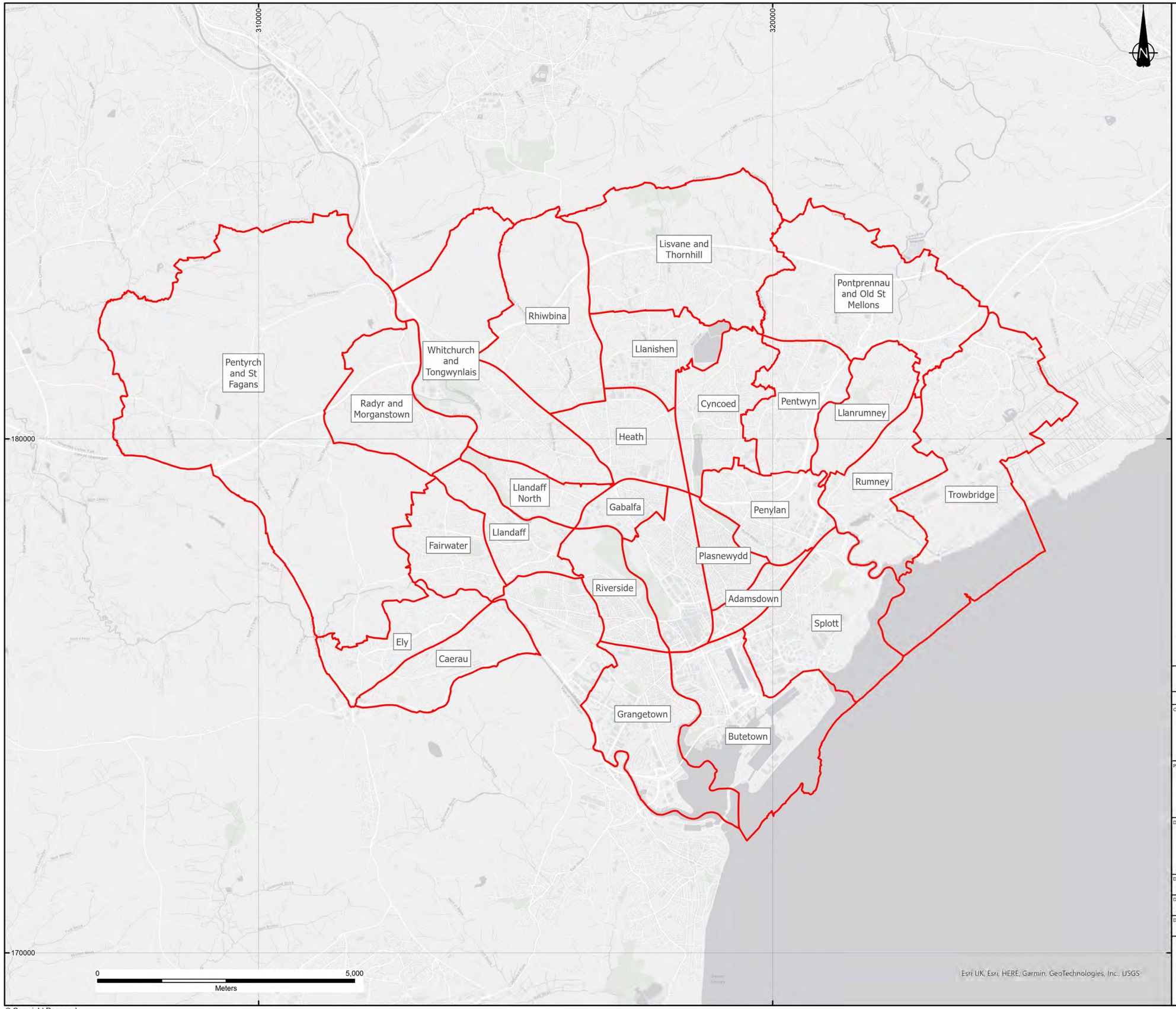
0 5,000 Meters

N:\CA\CA12850 - Cardiff CC GI SINC review\03 - Design\ArcGIS\CA12850-066 Strategic Green Infrastructure Opportunity Areas\CA12850-066 Strategic Green Infrastructure Opportunity Areas.aprx



KEY

Cardiff Wards

Notes:

Boundaries are indicative.

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CARDIFF STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

OVERVIEW WARD PLAN

DRG No	REV	SUIT. CODE
CA12850-001	A	--

DRG SIZE	SCALE	DATE
A2	1:50,000	11/12/2024

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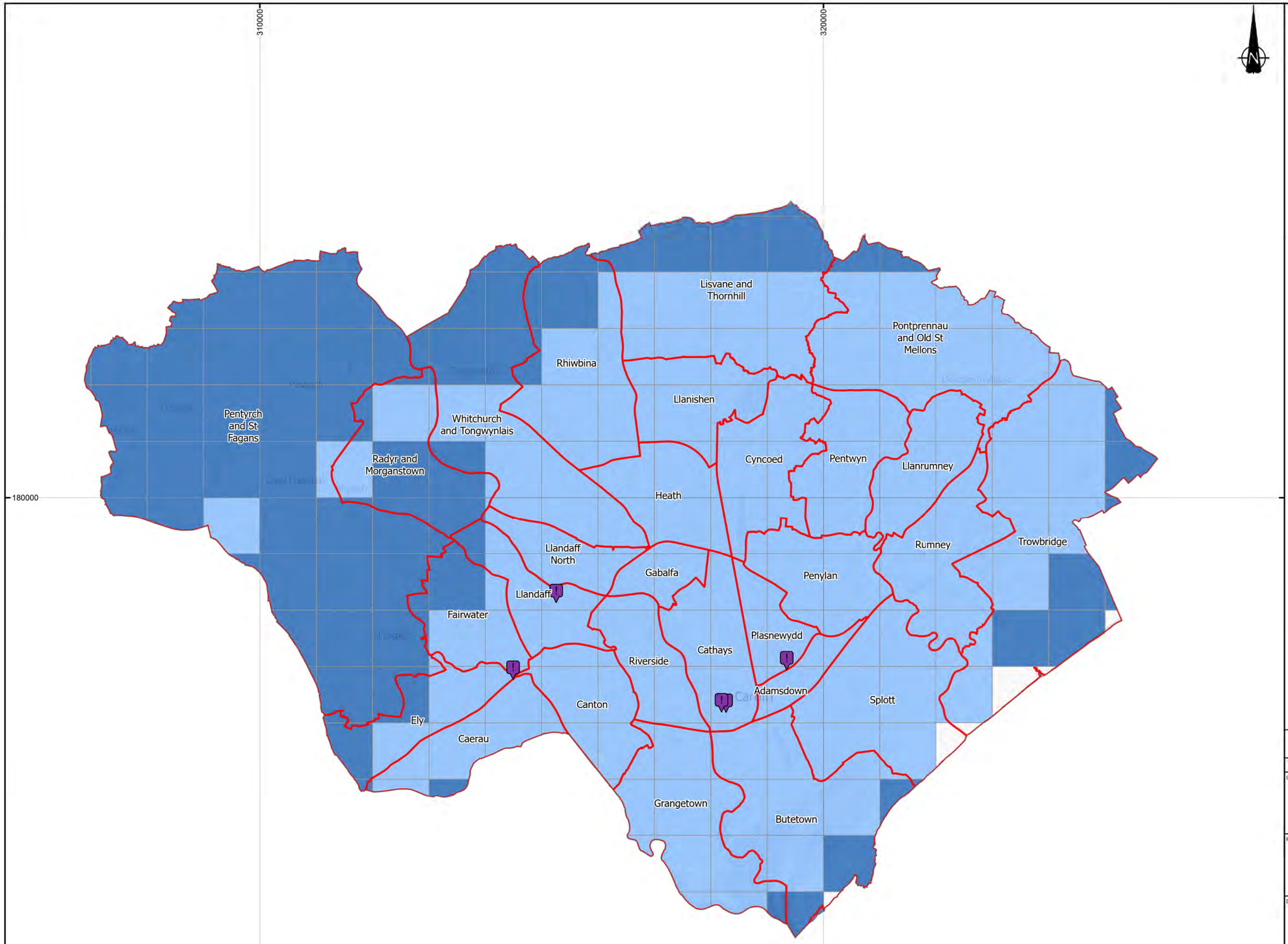

KEY

- Cardiff Wards
- Air Quality Management Areas (AQMAs) - Reported Nitrogen dioxide NO2

Air Quality Data - NO2 (2021)

- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50

Notes:

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D
A	FIRST ISSUE	12/12/24	RCB	AC	JH

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

AIR QUALITY PLAN

DRG No	REV	SUIT. CODE
CA12850-033	A	--

DRG SIZE	SCALE	DATE
A2	1:50,000	12/12/2024

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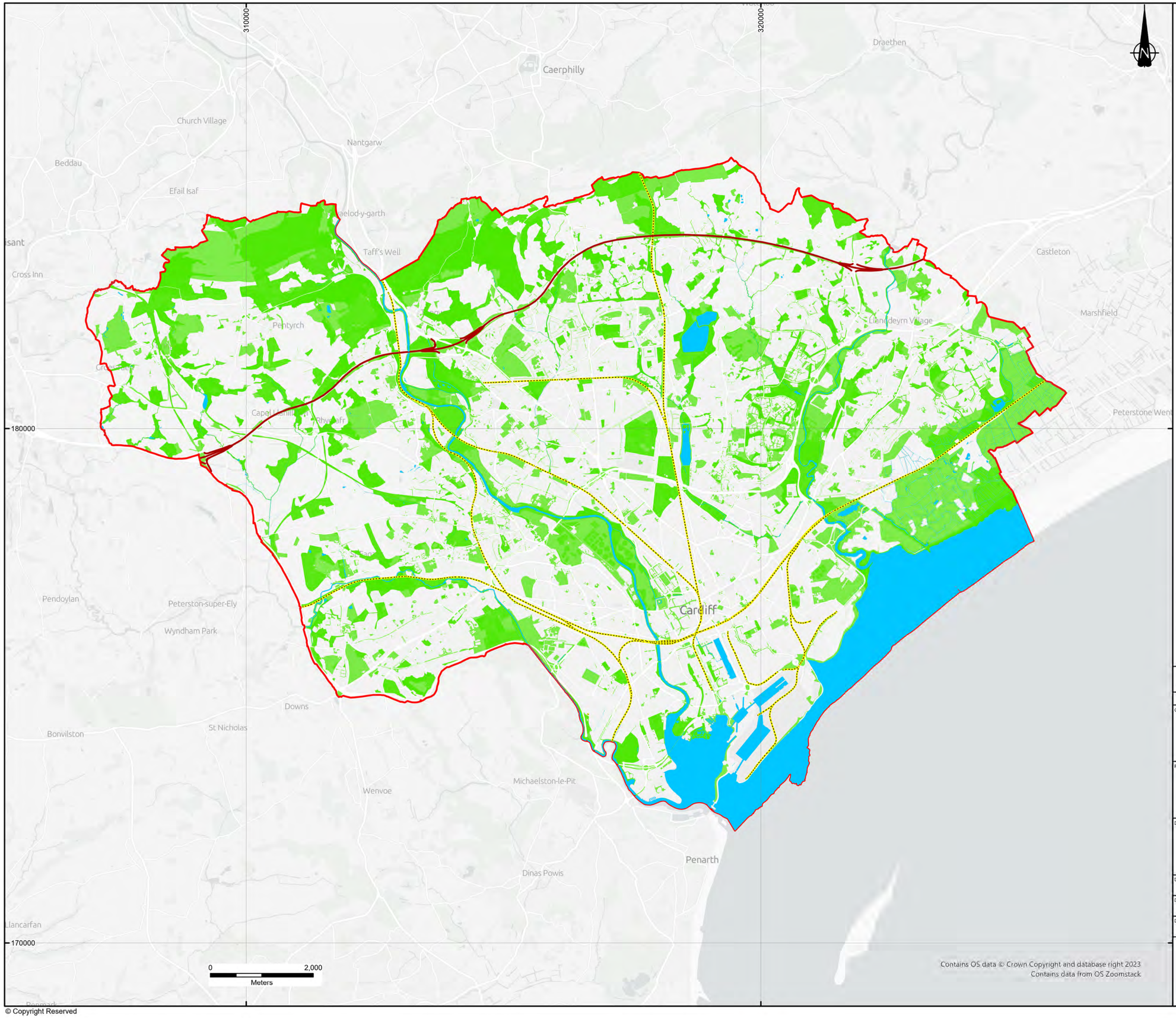

KEY

- Cardiff City Boundary
- Strategic Green Infrastructure Assets
- Strategic Blue Infrastructure Assets
- M4 Corridor
- Railway Corridor

Notes:

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
A	FIRST ISSUE	12/12/24	RCB	AC	JH

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

STRATEGIC GREEN AND BLUE INFRASTRUCTURE ASSETS

DRG No	REV	SUIT. CODE
CA1250-030	A	--

DRG SIZE	SCALE	DATE
A2	1:50,000	12/12/2024

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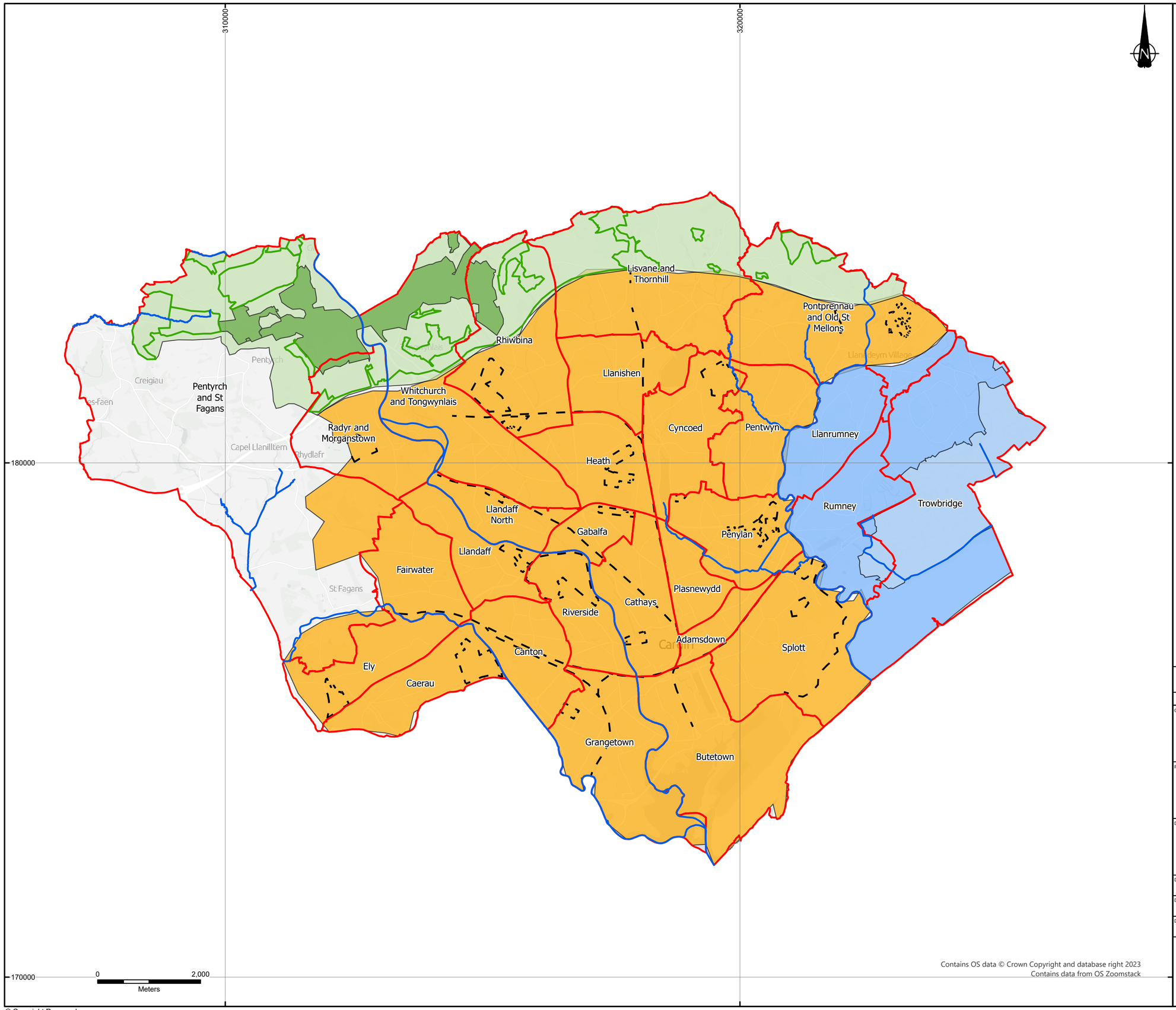

KEY

- Cardiff Wards
- Cardiff City Resilient Ecological Network (REN) Boundary
- Gwent Level REN Boundary
- Gwent Levels Core Zones
- North Cardiff Woodlands REN Boundary
- North Cardiff Woodlands Core Zones
- Cardiff City Nature Recovery Zones
- North Cardiff Woodlands Nature Recovery Zones
- Main Rivers

Notes:

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
B	LAYOUT UPDATES	13/01/25	BL	AC	JH
A	FIRST ISSUE	12/12/24	RCB	AC	JH

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

RECOVERY ZONES PLAN

DRG No	REV	SUIT. CODE
CA12850-034	B	--

DRG SIZE	SCALE	DATE
A2	1:50,000	13/01/2025

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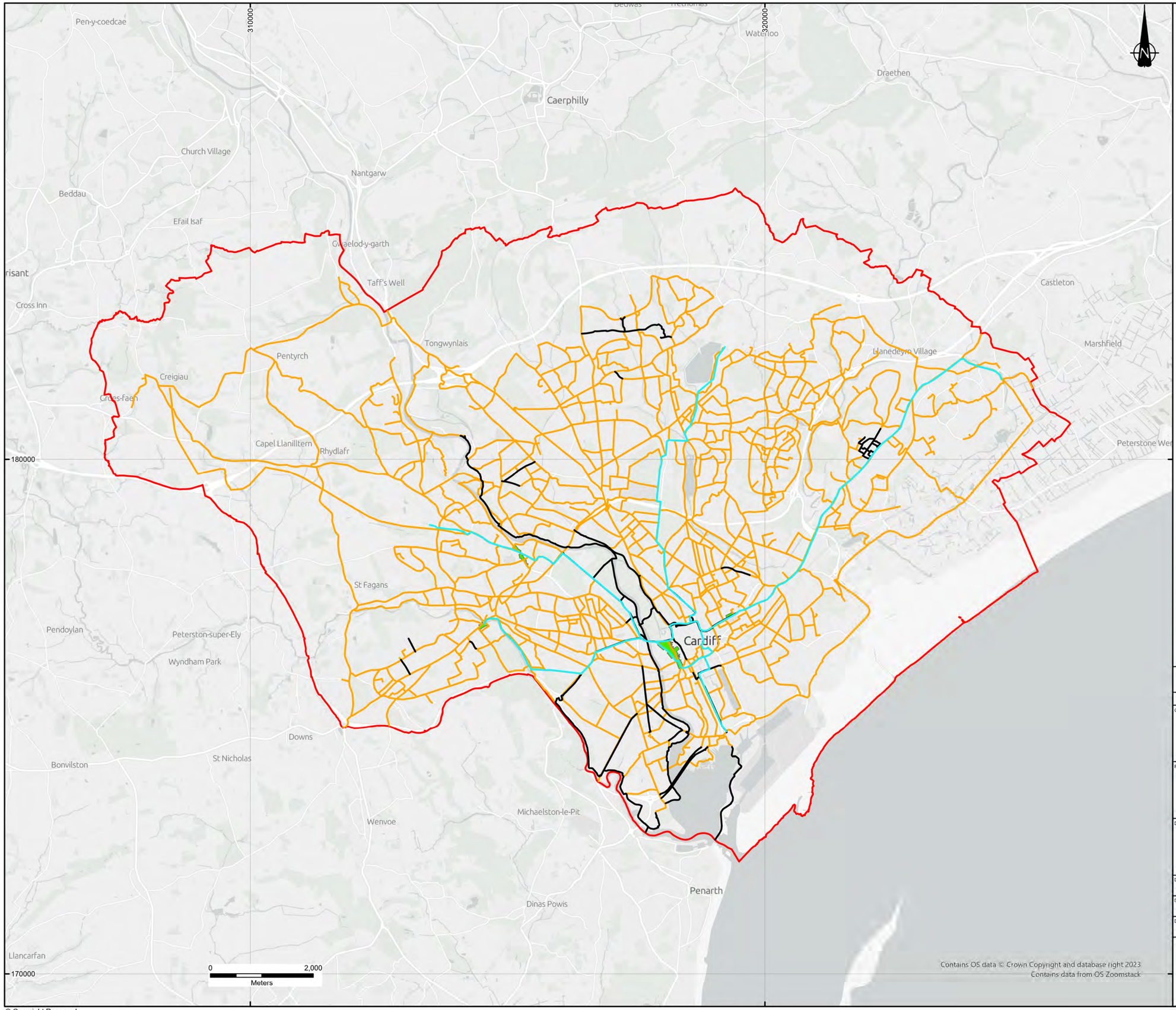

KEY

- Cardiff City Boundary
- Air Quality Management Zones
- Future Active Travel Network
- Existing Active Travel Network
- Cycleways

Notes:

Boundaries are indicative.

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A	FIRST ISSUE	12/12/24	RCB	AC	JH

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

ACTIVE TRAVEL ROUTES

DRG No	REV	SUIT. CODE
CA12850-063	A	--

DRG SIZE	SCALE	DATE
A2	1:50,000	12/12/2024

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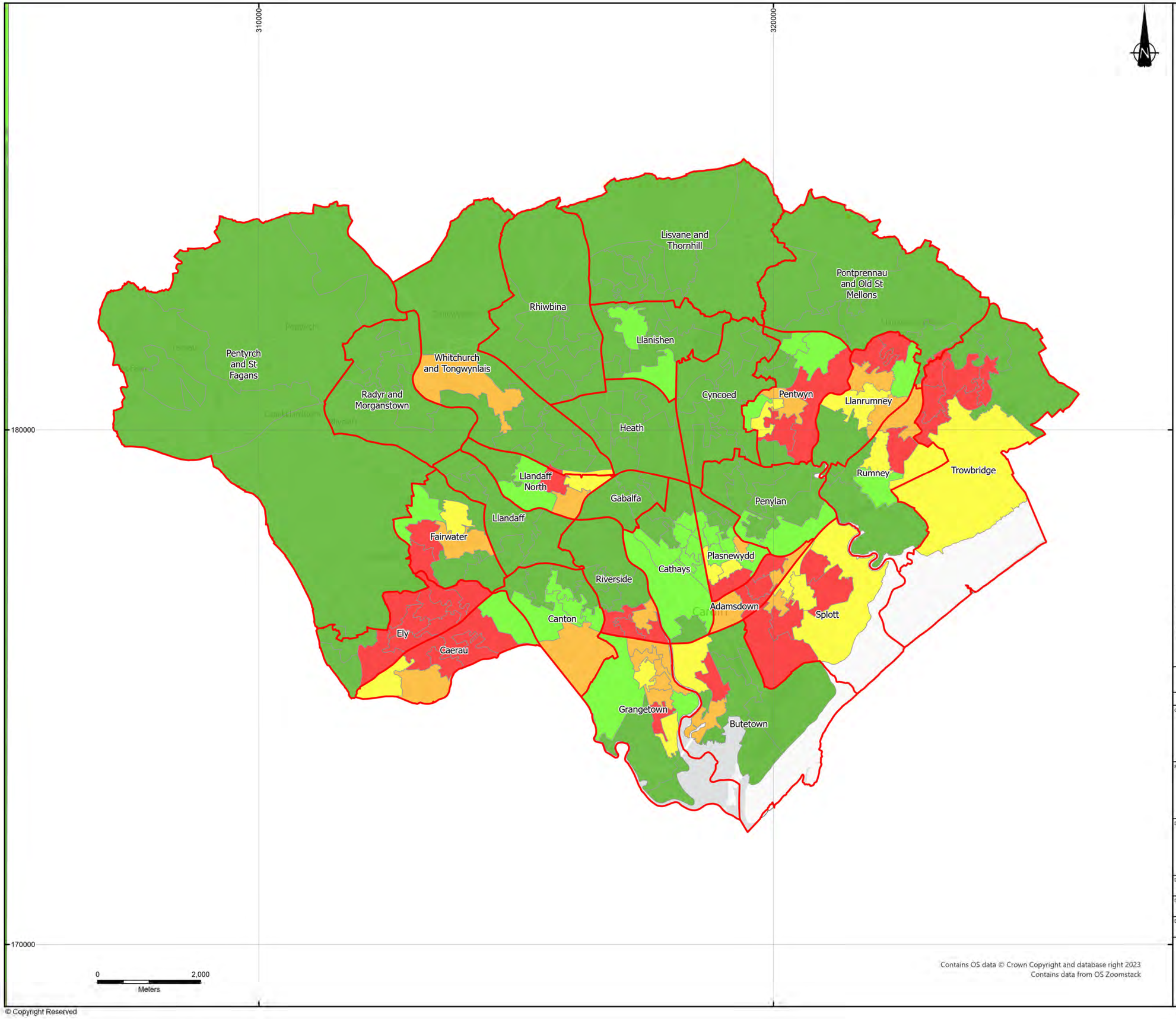

KEY

- Cardiff Wards
- 10% Most Deprived
- Between 10% and 20% Most Deprived
- Between 20% and 30% Most Deprived
- Between 30% and 50% Most Deprived
- 50% Least Deprived

The domains and their weights for WIMD 2019 are:

- Income 22%
- Employment 22%
- Health 15%
- Education 14%
- Access to services 10%
- Housing 7%
- Community safety 5%
- Physical environment 5%

Notes:

Boundaries are indicative.

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CARDIFF COUNCIL

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STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

SOCIAL DEPRIVATION PLAN

DRG No	REV.	SUIT. CODE
CA12850-032	A	--

DRG SIZE	SCALE	DATE
A2	1:50,000	12/12/2024

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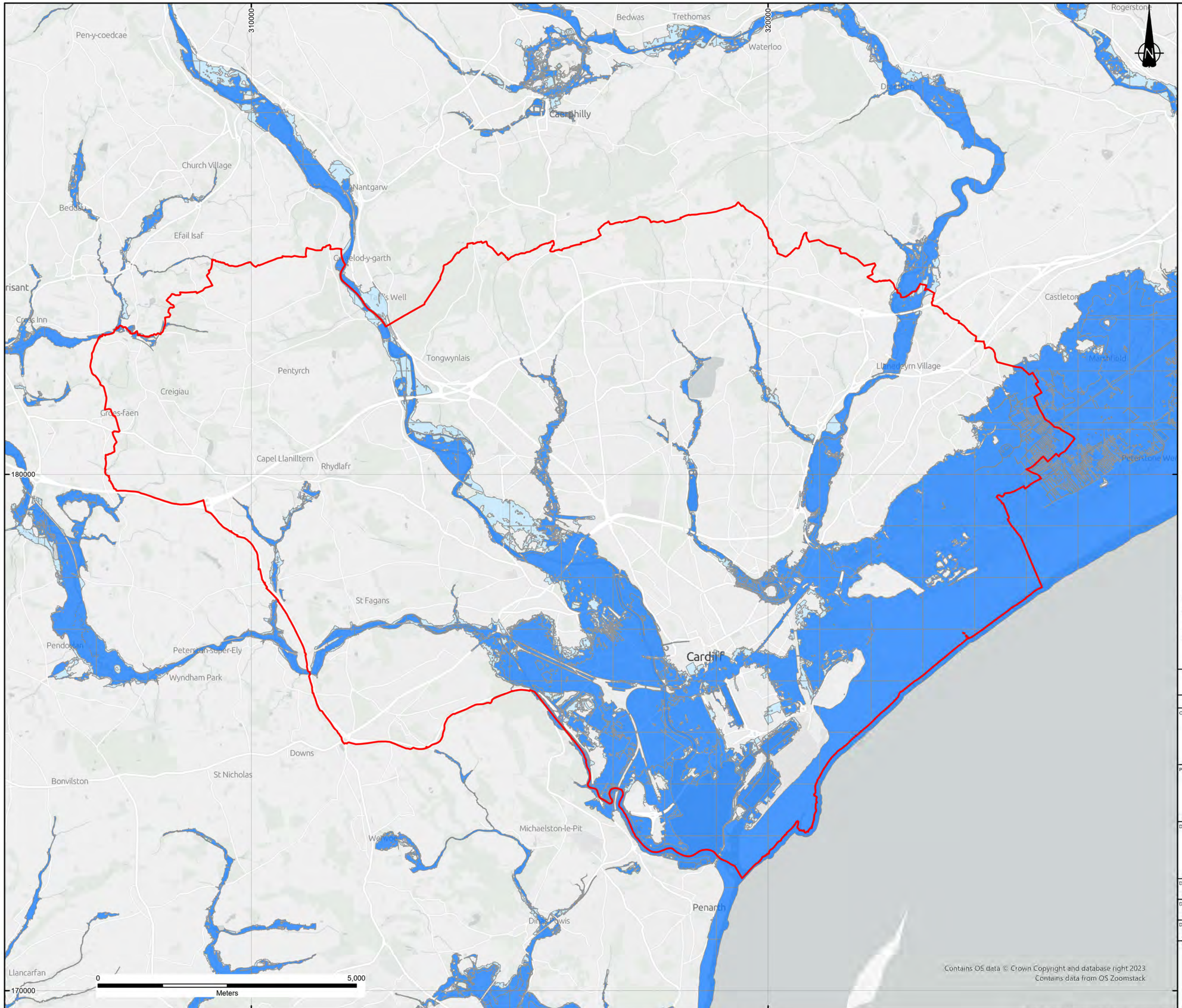

Notes:

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D
A	FIRST ISSUE	12/12/24	RCB	AC	JH

CLIENT

CARDIFF COUNCIL

PROJECT

STRATEGIC GREEN INFRASTRUCTURE ASSESSMENT

DRAWING TITLE

STRATEGIC FLOOD ZONES

DRG No	REV	SUIT. CODE
CA12850-065	A	--

DRG SIZE	SCALE	DATE
A2	1:50,000	12/12/2024

DRAWN BY	CHECKED BY	APPROVED BY
RCB	AC	JH

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